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OCTOBER 1987

THE RECORDING INDUSTRY MAGAZINE

VOL. 11, NO. 10



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FROM THE EDITOR

Cover: Just 30 miles northwest of Copenhagen, Denmark, Puk Studios features a 56 input Calrec UA8000 console, Mitsubishi X 8000 digital and dual Otari MTR 90 multi tracks, and a 7,800 watt, 4 way monitor system (with Fostex 30 inch subs) by Ole Lund Christensen. LEIDE® studio design by Andy Munro.



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As pro audio types march to the tune of AES this month, many in the world of music, audio and consumer electronics are caught in the biggest product introduction mess since quadrophenia. Can a "master quality" home recording format be introduced and then safeguarded so as not to pose a lethal threat to the recorded music industry, currently plagued by pirate tape copiers, large and small?

Should the new DAT industry be subjected to prior censorship, limited by government control that many technically aware individuals are protesting as a step backwards in our sensibilities? Then again, can we afford to let DAT go unchecked, and perhaps watch a bootleg bonanza further undermine income for the artists, writers and producers in the music business? It's one of those controversies with no right or wrong, no easy answer. It's a train with no brakes heading for a mountain that won't budge. Is there still time to cut a tunnel and lay some tracks?

The CBS copy-code scheme, such a hot potato that it's even being reported by the daily hometown papers, may or may not be a fair compromise for this difficult situation. Reaction to recent listening tests in the professional community indicate no uniform acceptance or rejection of the idea. The National Bureau of Standards is currently trying to make an unbiased appraisal of the system.

While at the moment most of the controversy has moved to copy-code or no copy-code, some are saying to look further for solutions, and find a way to optimize the resistance to illegal duplication without "distorting" the audio signal. Still others say that the whole thing will blow over in a cloud of smoke—that there won't be that many DATs sold to consumers due to the high prices, and that music is easy enough to copy to any consumer's desire with today's fine quality analog equipment; much ado about next to nothing.

Well, we'd like to know what *Mix* readers think. There's not much time before this thing could blow sky high. We'd like to run a consensus of what you think should be done to handle this situation with intelligence and sensitivity. Maybe one of you out there has the perfect solution. If so, we'll run it and maybe you can save the ranch.

Keep reading,

David M. Schwartz
Editor/Publisher



CURRENT



The 83rd AES Convention

The 83rd Audio Engineering Society Convention, scheduled for October 16 through 19 at the New York Hilton and New York Sheraton, is expected to be the best attended AES convention to date. The schedules and titles for the popular Technical Papers Sessions and Workshop Programs were recently released.

The Technical Papers titles and chairpersons are: Advances in Digital Audio/Video, Ken Pohlmann, University of Miami; Psychoacoustics and Listening Tests, Diana Deutsch, UC San Diego; Architectural Acoustics and Sound Reinforcement, Don Keele, Crown International; Recording, Mixing and Editing, Larry Boden, JVC; Transducers, John Vanderkooy, University of Waterloo, Ontario; Signal Processing, Robert Adams, dbx; Broadcast Audio Systems, Steve Lyman, Canadian Broadcasting Corporation; DSP Chips for Music Synthesis, Recording and Processing, John Strawn, S Systems; and Audio Measurements and Evaluation, Richard Cabot, Audio Precision.

The four Special Papers Sessions are: Transmission, Daniel Gravereaux, consultant; Acoustics and Sound Re-

inforcement, Ken Jacobs, Bose Corp.; Signal Processing, Don Eger, Crown International; and Transducers, John Bullock, Shure Bros.

Workshop subjects will be: Disc-based Audio Editing; User Interfaces for Electronic Music; Techniques for Subjective Listening Evaluation; Sound Reinforcement; Transformers in Audio; Visual Audio Monitoring and Metering, SPARS Workshop—Recording Studio Operations; Motion Picture Sound; Remote Audio Pickup and Miking for Broadcast; Sound in the Theater and Performing Arts; and Tape Recorder Maintenance. For more information call (212) 661-8528.

SMPTE Technical Program Announced

The technical program for the 129th Conference of the Society of Motion Picture and Television Engineers (SMPTE) was recently announced. Supporting the theme "Imaging and Sound—Today and Tomorrow," the program forms the basis for the 129th SMPTE Technical Conference and Equipment Exhibit, set for October 31 through November 4 at the Los Angeles Convention Center.

According to Frank Haney, program chairman, there will be 147 technical papers covering 16 general subjects: Archival: The 1988 Olympics; Film and Laboratory Technology; Image Processing; Film and Electronic Production; Fiber Optics; Digital Signal Distribution; HDTV; Film Laboratory Practices; Post-Production; Enhanced NTSC/Compatible HDTV; Audio for Film; Audio for Television; Beyond the Cathode Ray; Video Recording and EBus.

The conference will also feature an extensive exhibit of motion picture and television equipment, a

full schedule of SMPTE engineering and administrative meetings and the Society's Honors and Awards luncheon. For more information call (914) 761-1100.

DAT Legislation Moves Forward

The Commerce, Consumer Protection and Competitiveness Subcommittee of the House Energy and Commerce Committee recently passed "The Digital Audio Recorder Act of 1987," introduced by Representative Henry Waxman and Jim Cooper. The bill would require Digital Audio Tape (DAT) manufacturers to put a copy-code scanner chip in DAT machines before they could be imported or sold in the U.S. Music creators would then have the option of encoding their music with an inaudible "notch" to prevent unauthorized copying.

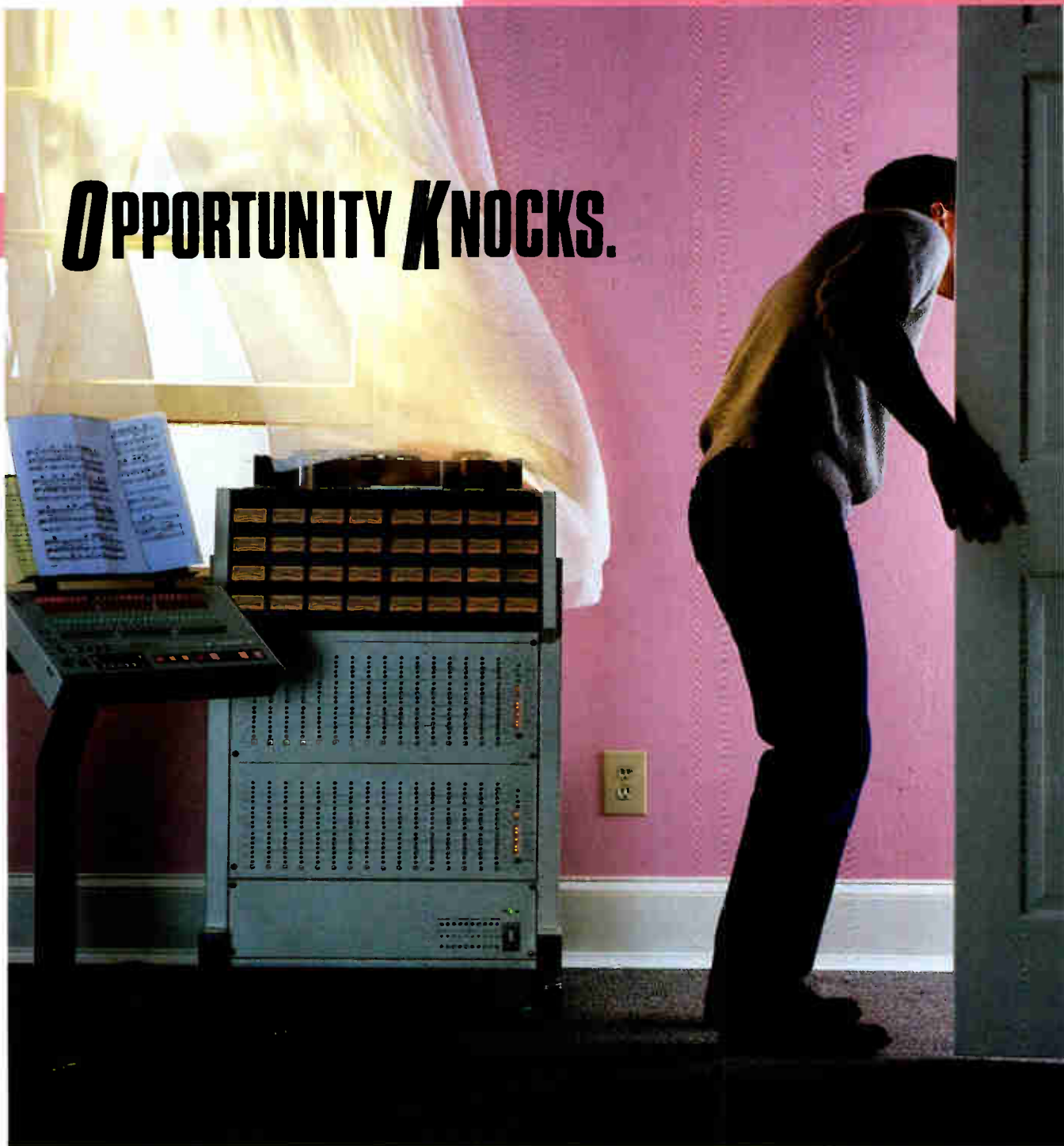
Some segments of the music industry have endorsed the system, but manufacturers of DAT machines contend that the copy-code system, developed by CBS Records, degrades music quality.

The controversy has created the most heated debate to hit the record industry in many years. The Recording Industry Association of America (RIAA), in support of the CBS-developed copy-code system, recently held listening sessions for recording professionals in Los Angeles, New York and Nashville. Reaction of those in attendance was mixed.

According to Emory Gordy Jr., independent producer and consultant to the A&R Department at MCA Records, "I could not hear any difference. If I tried to, it was a guess, and all those engineers I've worked with and respect had the same opinion that, at best, they'd be guessing as to whether there was

—CONTINUED ON PAGE 308

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INDUSTRY NOTES

Audio Design Group, a totally digital audio production facility in Seattle, WA, named **Brian Clune** as marketing director. . . **James Tipton** has joined **dbx** in Newton, MA as vice president for sales. . . **James Withers** was appointed Midwest regional sales manager for **Lenco's** electronics division. . . **Scott Kane** was named president of **Optimus, Inc.**, a Chicago film and videotape post-production company. . . **Everything Audio** has moved to a new location at 2721 W. Burbank Blvd. in Burbank, CA, (818) 842-4175. . . **Don Griffin**, president of **West L.A. Music** in Los Angeles, was elected president of **NAMM**. Griffin has served as NAMM vice president, treasurer and secretary. All NAMM officers are elected for one-year terms. . . The **American Film Institute (AFI)** and **Billboard** magazine have created a professional competition for non-theatrical videos. People interested in submitting a video for one of the categories in "**American Video Awards**" can contact AFI's Terry Lawler at (213) 856-7743. . . **James Moorer** has joined **Sonic Solutions** (the San Francisco firm that developed the **NoNOISE** system for cleaning up unwanted noise in recordings) as vice president of audio research. . . **James Williams** has been named president of **Cetec Gauss**, the manufacturer of high-speed dupe systems and professional loudspeakers. . . The **11th Annual Songwriter Expo**, North America's largest gathering of writers, composers and publishers, is scheduled for October 24 and 25 in Pasadena, CA. For more information on the classes, seminars and workshops, contact the Los Angeles Songwriters Showcase at (213) 654-1947. . . The **University of Sound Arts** (Hollywood, CA) honored outgoing president **Raghu Gadhoke** and welcomed its new chief administrative officer, **Amrita Singh** at a recent banquet. . . **Michael Wuellner** was appointed **Audio-Technica's** sales manager, professional products. . . **Greg McVeigh** is new director of marketing

for the Costa Mesa, CA-based **QSC Audio**. . . **Shure Brothers** presented its top sales award for the second straight year to its Philadelphia/mid-Atlantic representative **S.K. Macdonald**. . . **Midnight Records**, a new record company, has been established at 842 Key Route Blvd., Albany, CA 94706, (415) 527-6925, along with a 24-track recording facility, music publishing company and audio equipment rental company. Company officers are: **Claire Pister**, president; **Jeffrey Norman**, vice president, A&R; **Ann Fry**, vice president, marketing & promotion, **Jim Gaines**, director A&R; and **Maureen Droney**, A&R coordinator. . . NYC's **Howard Schwartz Recording Studios** has hired **Ralph Kelsey** as post-mixing engineer, **Jeff Peterson** as chief design engineer and **Perry Lancaster** as maintenance engineer. . . **Ginnie Gardiner** has been appointed sales director for **Post Perfect**, a new NYC post-production facility with \$7 million in equipment. . . **Andrew Mougis** was appointed director of sales, professional tape division, **Sony Magnetic Products Company**. . . **Lee Martin** is temporarily general manager at **Dallas Post-Production Center** following **Nick Riccelli's** resignation. . . **E-mu Systems** appointed **Stephen Tritto** chief operating officer. . . **Sound Code**

—CONTINUED ON PAGE 305

Douglas Finch Dickey, Vice President for Design Communications at Solid State Logic in Oxford, England, died August 8 at age 35 after a long illness. Admired widely throughout the professional audio community, Doug played a major role in establishing Solid State Logic as a leader in the design and marketing of high end audio mixing systems, first as head of SSL's professional audio team in the U.S., and subsequently in the Oxford offices. He will be deeply missed by his friends and coworkers.

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SESSIONS AND STUDIO NEWS

NORTHWEST

Studio D in Sausalito, CA had **Preston Glass** producing the English group **Imagination** for RCA Records, **Maureen Dronney** at the controls, **Jim Vereecke** assisting . . . At **Dave Wellhausen Studios** in SF new album projects included **The Make**, produced by **Jimmy Goings**, **Penelope Houston**, produced by the late **Snakefinger**, and **M-1 Alternative**, produced by **Matt Wallace** . . . San Francisco's **Slings and Arrows** recorded basics for their debut record with producer **Dan Levitin** at **Emeryville Recording Company**, with **Randy Rood** engineering. . . **Crescent Wind** were in **Avalanche Recording** in Northglenn, CO laying down tracks with session ace Richard Shlosser on drums. **Duane Scott** produced and engineered the sessions with **George Counnas** and **Harry Warman** assisting. . . **Russian Hill Recording** in SF recorded the musical score on a new Ed Pressman film entitled *Walker*, directed by Alex Cox (*Repo Man*, *Sid & Nancy*). Joe Strummer, from The Clash, is the film's composer. RHR's **Samuel Lehmer** engineered the sessions . . . At **London Bridge Studios** in Seattle, **Rick Fischer** was in producing and engineering **Agent Boy**. Assisting on the project was **Peter Barnes**, **Ed Brooks** and **Matthew Sutton** . . . Long-time David Bowie guitarist **Earl Slick** was in at **Prairie Sun Recording** (Cotati, CA) with Kevin Russell (of 707 fame) to co-produce tracks. P.S.R. veteran **Steve Fontano** engineered the project. . . **The Scene** have been recording their debut record with producer and 415 A&R director **Dan Levitin**. The record is being engineered and co-produced by **Stevie Heger**. Basic tracks were recorded at **Dave Wellhausen Studios** in San Francisco, and are being mixed at **Alpha & Omega Studios**, also in SF. . . **Christie Josef**, lead singer of **Temper**,

has been working on a solo four-song demo tape with former KFRC production director **Albert Lord**. Christie was in Lafayette, CA's **ATR Studios** overdubbing lead vocals with **Duncan Rowe** engineering. . . The completion of a major studio upgrade at **Paradise Sound Recording** in Index, WA attracted attention in Europe. **Private Life**, a rock band from West Germany, recently chose the studio to record their first American album project with producer **Bill Grabowski**. . . Eddie Money's keyboard player, **Kai Gilbert**, has been cutting tracks for his second solo effort at **TRS, Inc.** in Sunnyvale, CA. . . A new product from **Clorox Corp.**, the campaign for the U.S. **Sprint** calling card, and a six-spot national TV campaign for **Sterling** autos are just a few of the projects that have recently occupied **Mary** and **Peter Buffett**, owner/operators of San Francisco's **Independent Sound**. . . At **Granny's House** in Reno, NV, **Dave Mason** and his producer **Jimmy Hotz** completed mixing Dave's new album *Two Hearts*. The album, to be released on Voyager/MCA in September, includes guest performances by **Steve Winwood** and **Phoebe Snow**. . . **Julian White** and **James Greening** have finished their digital master tapes—White's is an all-Brahms piano solo album, and Greening's is a world premiere of Ernst Bacon's "Sonata for Violin and Piano." It was recorded at **Hollcraft Recording** in Pleasant Hill, CA and engineered by **Ed Hollcraft**. . . San Francisco's **Different Fur Recording** was host to **Roy Thomas Baker** producing **T'Pau** tracking and mixing with **Jerry Napier** engineering. . . .

SOUTHWEST

Reelsound's remote truck recorded Grammy artist **Albert Collins** for a PBS special at Antone's Blues Club in Austin.

The five-camera shoot was directed by **Bruce Kuerton**. **Earl Miller Productions** handled video with Reelsound doing multi-track and stereo feeds for the show. **Malcolm Harper**, **Mason Harlow** and **Gordon Garrison** were engineering . . . **Greg Voltz**, former lead singer of **Petra**, was at **Rivendell Recorders** (Pasadena, TX) cutting a lead vocal for a single release that will benefit March Houston for Life. **Chuck Sugar** was producer and engineer of the project. The single is titled "All Out War". . . Dallas rockers **Debutante** completed the mixing of their latest original tracks at **Goodnight Dallas** with engineer **Ruben Ayala**. The tunes will be included in their upcoming cassette release. . . Producer **Charlie Brown** was in Dallas' new **Downtown Sound** producing album remixes for **Zola Levitt**. Levitt's self-titled, nationally broadcast television program includes a music ministry. . . .

NORTH CENTRAL

At **Pearl Sound** in Canton, MI, **Micro-wave** has been recording and mixing an album for CBS Records with producer **Bootsy Collins** and engineer **Ben Grosse**, assisted by **Michael Fitzsimmons** and **Chris Andrews**. Also in recently: **The Romantics**, **Rick Medlocke & Blackfoot** and **Toby Redd**. . . Satellite production activity for **Streeterville Studios** in Chicago has featured major projects for Ogilvy & Mather clients **Sears** and **Ameritech Mobile** phones. Executive producer **Phil Bodwell** directed voice sessions, via satellite. . . At **Studio A**, Dearborn Heights, MI, Light Records recording artists, **Commissioned**, recorded rhythm tracks for their next album release, produced by **Fred Hammond** and **Michael Brooks**, **John Jaszcz** engineering with **Randy Poole** assisting. . . Keyboardist

6. V Series Enhanced Equalization



Freelance recording engineer and producer Mike Bronstein is the choice of established artists like Barry Manilow and talented newcomers D'Molls alike. Working out of Westlake Studios using one of their two Neve V Series 60-input consoles with enhanced EQ, Mike's work is acknowledged as some of L.A.'s best.

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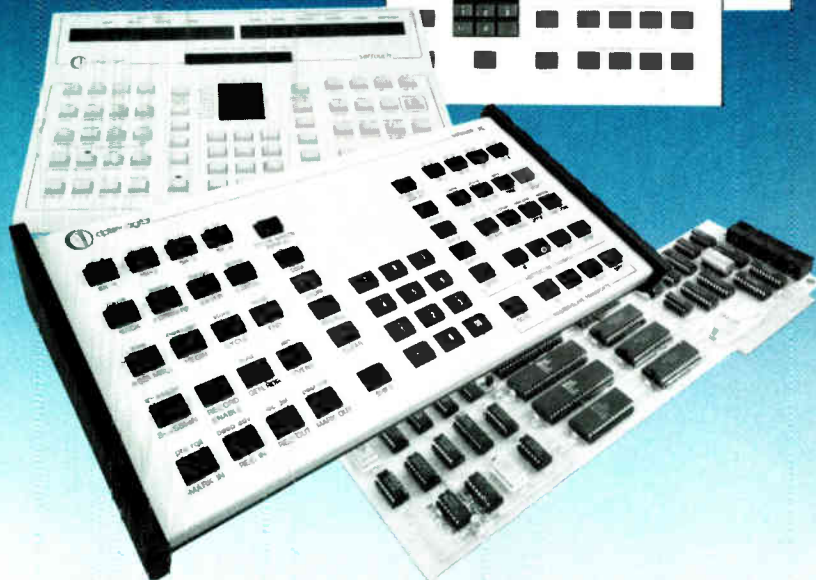
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Fred Simon completed a demo at **Studio-media** in Evanston, IL for Ian Matthews-Open Air Records, a subsidiary of Windham Hill, with newly married **Benj Kanters** engineering. Kanters also engineered new demos by **Mike Miles** and the **Lee Street Band**. . . Local Chicago artist **Vincent Paul Hanrahan** recently completed work on his first full-length demo tape at **Crystal Studios** in Lombard, IL. . . **Natalie Cole** was at **Paragon Studios** in Chicago recording vocals for the gospel song "Care-taker," which will be included on the Yancy Family Album currently in production. The session was produced by **Kevin Yancy** and **Michael Wade**. **Marty Feldman** was the engineer for the session. His assistant was **Scott Barnes**. . . .

SOUTHEAST

Activity at **Cheshire Sound Studios** in Atlanta included sessions with **Mikey Craig**, formerly of Culture Club, working on a new project for Virgin Records. **Charlie Singleton** and Craig produced, **Lewis Padgett** engineered. . . At **Traxion Studios**, Greensboro, NC, **Reggie Gilmore** finished demo work with **Barry Webb** engineering and producing. . . At **Sounds Unreel** in Memphis, **Jimmy Davis & Junction** were recording and mixing their debut album for QMI Music/MCA. **Jack Holder** and **Don Smith** produced and recorded the album, with engineering assistance from **Evan Rush**. . . At **Bennett House Studios** in Franklin, TN, the **Jay Patten Band** cut demos with engineer **Eric Paul**, and **The Goats** mixed their new album with engineer **Bill Deaton**. . . At **Ardent Recording** in Memphis **Alex Chilton** was mixing his new album for Big Time Records. **Tom Laune** was behind the SSL console. . . At **Criteria Recording Studios** in Miami, FL, **Lewis Martinec** was producing a track titled "Who's Getting Serious" for R&B artist **Kashif** on Arista Records. Engineering was handled by **Mike Couzzi** assisted by **Charles Dye**. . . **John Anderson** was in the **Emerald Sound Studio** in Nashville recording his latest MCA album with **Jimmy Bowen** producing. **Steve Tillisch** and **Russ Martin** engineered. . . **Alpha Audio Music & Recording Services** of Richmond, VA, and The Martin Agency have completed production of radio and television advertising for Kings Dominion, a Virginia theme park located between Washington, DC and Richmond. The production was supervised by Martin's broadcast pro-

—CONTINUED ON PAGE 24

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by Ken Pohlmann

ERROR CORRECTION

JUST THE FUNDAMENTALS, MA'AM

One thing is for sure—no one ever accused Insider Audio of being perfect. Another fine example of imperfection occurred last spring when I blithely penned an article on the CIRC error correction code, as employed on CD and in modified form, DAT. I figured Cross Interleave Reed Solomon Code was pretty much a household fixture, and well familiar to almost everybody. I jumped right into the nitty gritty with nary a word of explanation.

Boy, did I catch hell. Postcards flooded in like rain during hurricane season. Readers were steamed, resentful and generally author-unfriendly. They figured I was trying to snow them, or worse yet, act like a pointy-headed showoff.

Well, I am a point-headed showoff, actually. But I'd hate to lose the few friends I still have left. So let's try to correct my error, and take a look at error correction fundamentals, the basis upon which CIRC and all other digital audio codes are founded.

Error correction is one of the great opportunities, and obligations, of all digital audio storage mediums. First, error correction is a great opportunity

because it offers something never before possible with analog mediums—the chance to correct your mistakes. When you scratch an LP record, the grooves are irrevocably damaged, along with the information contained in them. Forever after, there will be a click or pop as the damaged part of the groove passes underneath the phonograph needle.

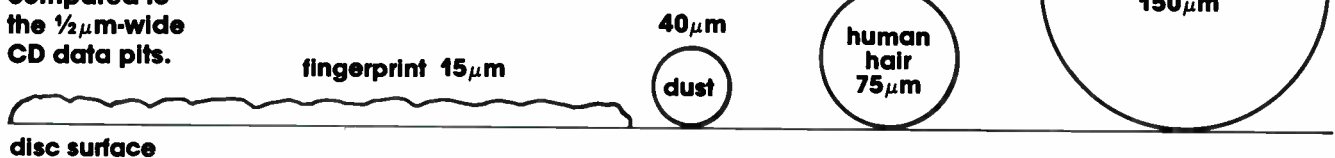
But when you scratch a CD, the nature of the data on the disc and the player's design offer you a second chance. Specifically, the data on the disc has been specially encoded with an error correction code, and your player uses the code to correct for damaged data. Thus it delivers the original undamaged variety instead, performing its error correction every time the disc is played.

To illustrate a fundamental aspect of error correction, consider the two messages below:

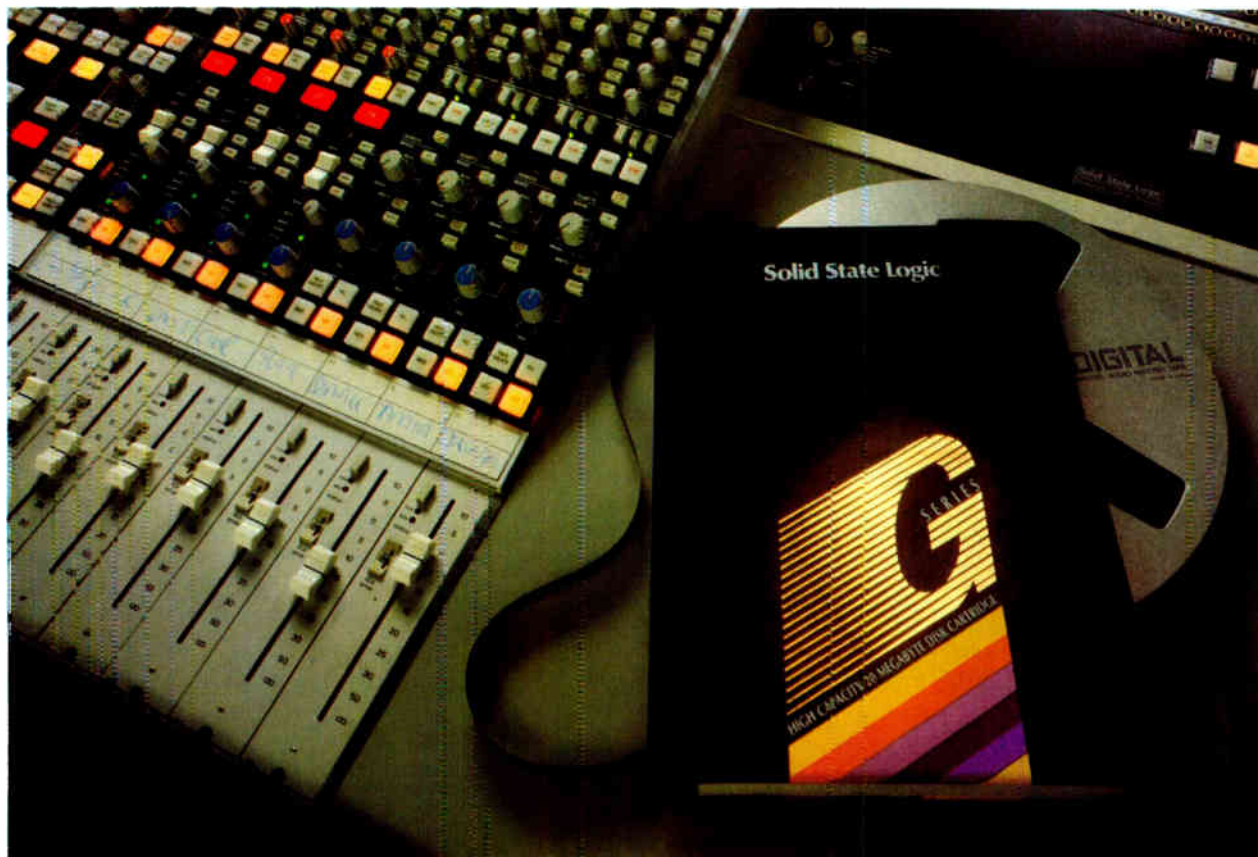
1. Please turn to page 345 in your hymnals.
2. Hey! Let's party! Hey! Let's party!

Assume the first message represents the information in an LP groove, and the second is the data in a CD pit track. Now, lay a finger vertically across this

FIGURE 1:
Even minute obstructions such as dust particles are large compared to the $\frac{1}{2}\mu\text{m}$ -wide CD data pits.



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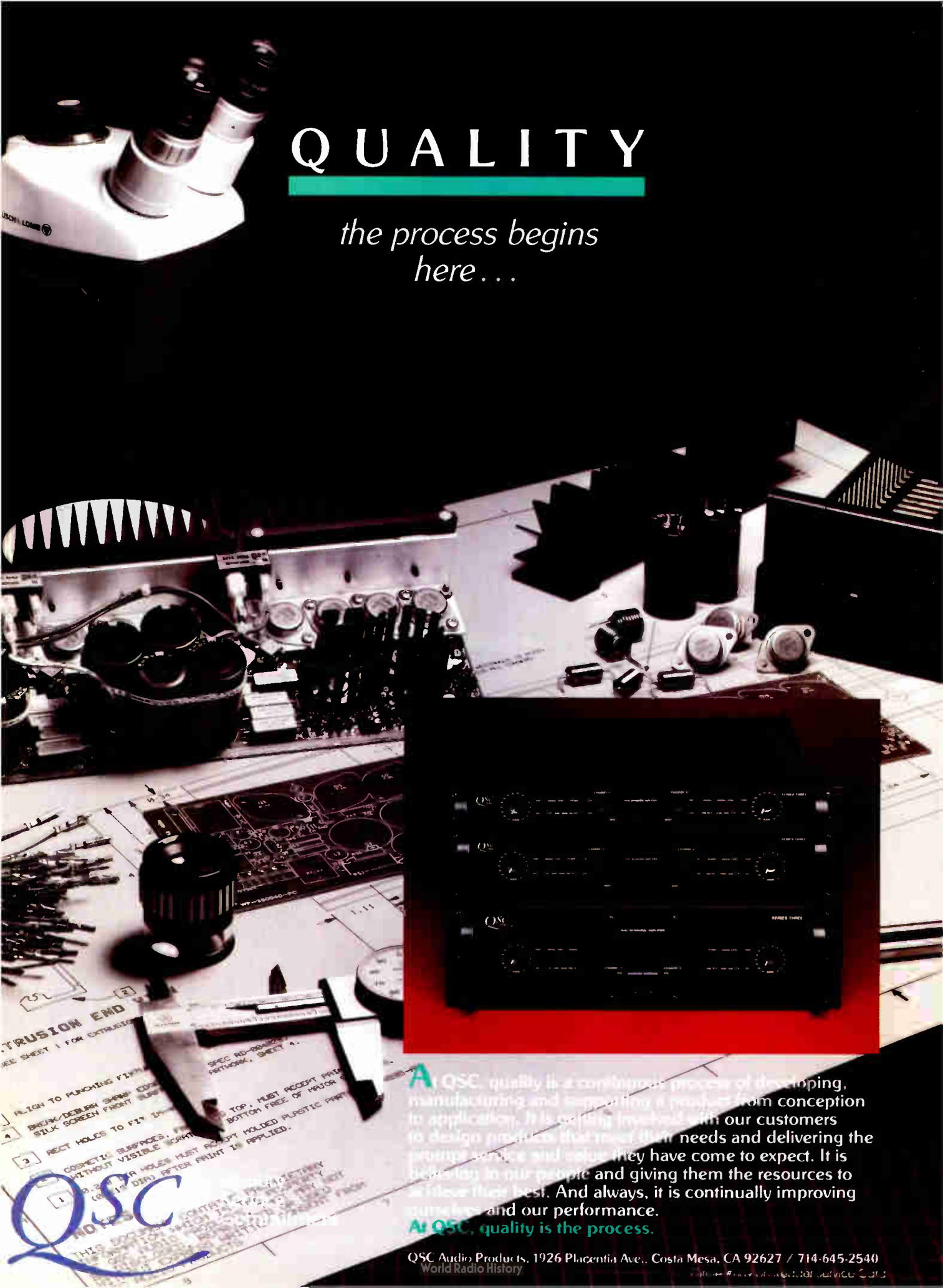
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COSMETIC SURFACES, IF
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page, representing a scratch. You'll observe that part of the first message is irrevocably gone, whereas the second message is intact, because it can be reconstructed. Specifically, we have used redundant data to repeat the message. By comparing the redundant messages, we can overcome the effect of the error. Note that we haven't prevented the error, we have simply successfully insured against its effect. Clever, eh?

Of course, even the most clever of ideas has its limitations. As you lay more and more fingers over the page, it becomes more and more difficult to successfully reconstruct the digital message. Thus the severity of the error plays an important role; our ability to correct errors has limitations. Also, if you lay your finger horizontally across the page, you might completely obscure the entire line, destroying both the message and its redundancy. Thus the nature of the error plays a part

too. Also, we should note that error correction demands a price of overhead. In this case, the error correction coded message required twice the storage space.

On the other hand, error correction is an obligation. A digital audio recording might require storage of billions of bits. With such great data density, even the smallest speck of dust would wipe out a considerable number of bits, as shown in Fig. 1. In reality the type of error correction utilized would have to be a great deal more sophisticated than a simple redundancy scheme. Even one bad bit could wreak havoc. For example, if the digital word 0000000000000000 (representing silence) was misread as 1000000000000000 (representing a pretty loud level), a click some 90 dB above the silence would result. For satisfactory digital audio storage, error correction is essential. Data on a digital audio recording must be error correction-encoded when the recording is made, and a digital audio player

FIGURE 2: The ISBN uses a weighted check sum to verify validity of book numbers.

book #	sum	weighted sum
a	a	a
b	a+b	2a+b
c	a+b+c	3a+2b+c
d	a+b+c+d	4a+3b+2c+d
e	a+b+c+d+e	5a+4b+3c+2d+e
f	a+b+c+d+e+f	6a+5b+4c+3d+2e+f
g	a+b+c+d+e+f+g	7a+6b+5c+4d+3e+2f+g
h	a+b+c+d+e+f+g+h	8a+7b+6c+5d+4e+3f+2g+h
i	a+b+c+d+e+f+g+h+i	9a+8b+7c+6d+5e+4f+3g+2h+i
j	a+b+c+d+e+f+g+h+i+j	10a+9b+8c+7d+6e+5f+4g+3h+2i+j

a) The weighted sum is formed from the book number.

book #	sum	weighted sum
0	0	0
6	6	6
7	13	19
2	15	34
2	17	51
2	19	70
3	22	92
8	30	122
8	38	160
0	38	198 = (11) × (18) ≡ 0 modulo 11

↓
verified

b) When reduced to mod 11, the zero value verifies validity of ISBN.

data bits	parity bit
00000000	0
00000001	1
00000010	1
00000011	0
00000100	1
00000101	0
00000110	0
00000111	1
↓	↓
↓	↓
↓	↓
11111111	0

a) Even parity

data	parity	
001011010		001011010
000011110		000001110
001100101		101100101
110011101		000011101

transmitted received

OK
error detected
error detected
error not detected

parity check

b) Examples of transmitted/received words and parity check.

FIGURE 3: Parity can be used for simple error detection. It forms the basis for more sophisticated methods.

must be able to detect, correct, or conceal any errors that occur during playback.

When error correction decoding takes place, the errors must first be detected. While this might sound obvious, the problem can be considerable. If presented with a data word, could you tell whether or not an error had occurred? For example, does 1100101000011110 contain an error? Unless you are psychic, there's no way to tell. I could send the message twice: 1100101000011110 1100101100011110, and close examination would reveal a difference between them. Obviously, both cannot be correct, but which one is the right one? I could send the message three times: 1100101000011110 1100101100011110 1100101000011110, and you might have a good suspicion of which one was correct, but would you be sure? What if I sent the message three times, and they were all different?

While simple repetition is an inefficient way of going about error detection, a more enlightened variation, data redundancy, is the essence of error detection and correction. Redundant data is extra information derived from the original information; hence it is redundant. In general, the greater the redundancy, the better the error correction. Of course, redundancy

FIGURE 4: Row and column check sums can be used to detect and correct errors in data blocks.

10	04	04	02
05	04	11	02
01	12	06	03
00	07	12	06

a) Original data

10	04	04	02	20
05	04	11	02	22
01	12	06	03	22
00	07	12	06	25
16	27	33	13	89

b) Data with check sums

10	04	04	02	20
05	04	11	02	22
01	18	06	03	22
00	07	12	06	25
16	27	33	13	89

data error (arrow to 18)
column error (arrow to 18)
row/error (arrow to 22)

c) Example of detected/ corrected error

adds to storage overhead, and as we have seen, must be optimized in a practical system; this leads to the development of elaborate error correction codes which make very efficient use of redundancy by coding the information in certain ways.

One example of coded information is the ISBN (International Standard Book Number) code found on virtually every book published. No two books, no two editions of the same book have the same ISBN. Even soft and hard cover editions of a book have different ISBNs. An ISBN number

is more than just a series of numbers. For example, consider the ISBN number, 0-672-22388-0 (the hyphens are extraneous). The first digit ("0") is a country code, for example 0 is for the U.S. and some other English-speaking countries. The next three digits ("672") is a publisher code. The next six digits ("22388") is the book number code. The last digit ("0") is particularly interesting; it is a check digit. It can be used to verify that the other digits are correct. The check digit is selected to make the modulo 11 weighted check sum of the ISBN equal 0. In other words, when the digits are reduced to sum modulo 11 (divide by 11 and take the remainder) of the weighted sum, the mod 11 of the weighted sum equals 0 modulo 11. (To maintain uniform length of ten digits per ISBN, the Roman numeral "X" is used to represent the check digit "10"). Given this code, with its check sum, we can check the correctness of any ISBN by adding together the series of digits, and comparing them to the last digit. Fig. 2 illustrates verification of the ISBN in our example.

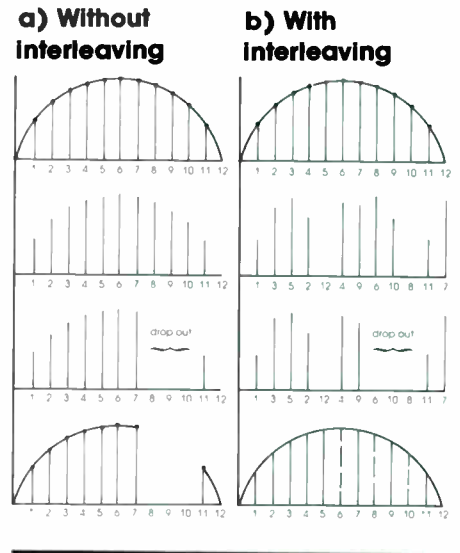
In practice, the redundancy contained in correction codes often takes the form of a parity bit, added to every data word. The parity bit is chosen so the number of ones or zeroes in the group (data word plus parity bit) is even or odd. For example, a parity bit may be formed with this rule: if the number of ones in the data word is even (or zero) the parity bit is made zero; if the number of ones is odd, the parity bit is made one. The total number of ones will always be an even number (or zero); this is called even parity. By the same token, odd parity could be used.

That scheme allows for error detection of received data: any word with an odd number of ones must be invalid. Fig. 3 shows a number of words and parity bits. The scheme can detect 1-bit errors in data (actually all errors involving an odd number of bits). However if two (or any even number) bits are bad the scheme fails to detect the error, and a bad parity bit would cause other good data to be flagged as erroneous. Moreover, the scheme cannot ascertain which bit is bad, thus it cannot correct errors. Clearly, a more sophisticated scheme is needed.

For efficient correction, essentially, more parity bits are required to solve the problem, and the algorithm used

FIGURE 5:

Interleaving can be used to enhance correctability of burst errors.



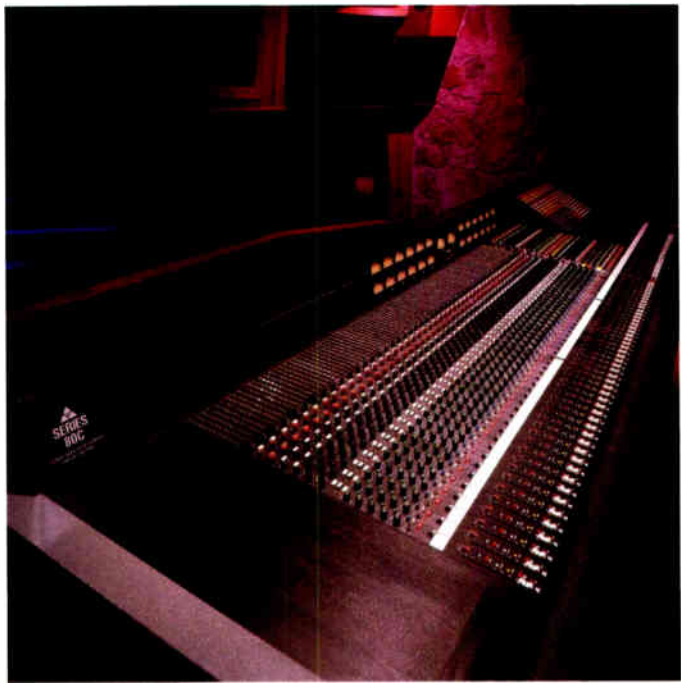
to select the parity bits determines the performance of the error correcting code. For example, in some codes the data is divided into blocks, and parity values added to each block. The parity values contain valuable information used to correct for errors.

Consider the example in Fig. 4 a, b, c. In addition to the 12 data values in (a), nine extra parity values are created and appended to the original data block. They are placed at the end of each row and column, and form the sum of that row and column as shown in (b). Note that a parity value is also included for the parity row, and column. If an error occurs in any data (or parity) value, the error can be easily located, and the correct value can be easily calculated, using the other data present.

For example, suppose that the data block in (c) was received. As we recalculate each parity value at the receiving end, and check it against each transmitted parity value, we observe a disagreement. In fact, there is a disagreement in both a row and a column parity value. The intersection of the row and column points to the error. Furthermore, we can now substitute in the correct value, derived from the transmitted parity values. The data in the block is thus substantially more reliable. Of course, instead of 12 values, 20 are now required for the error code.

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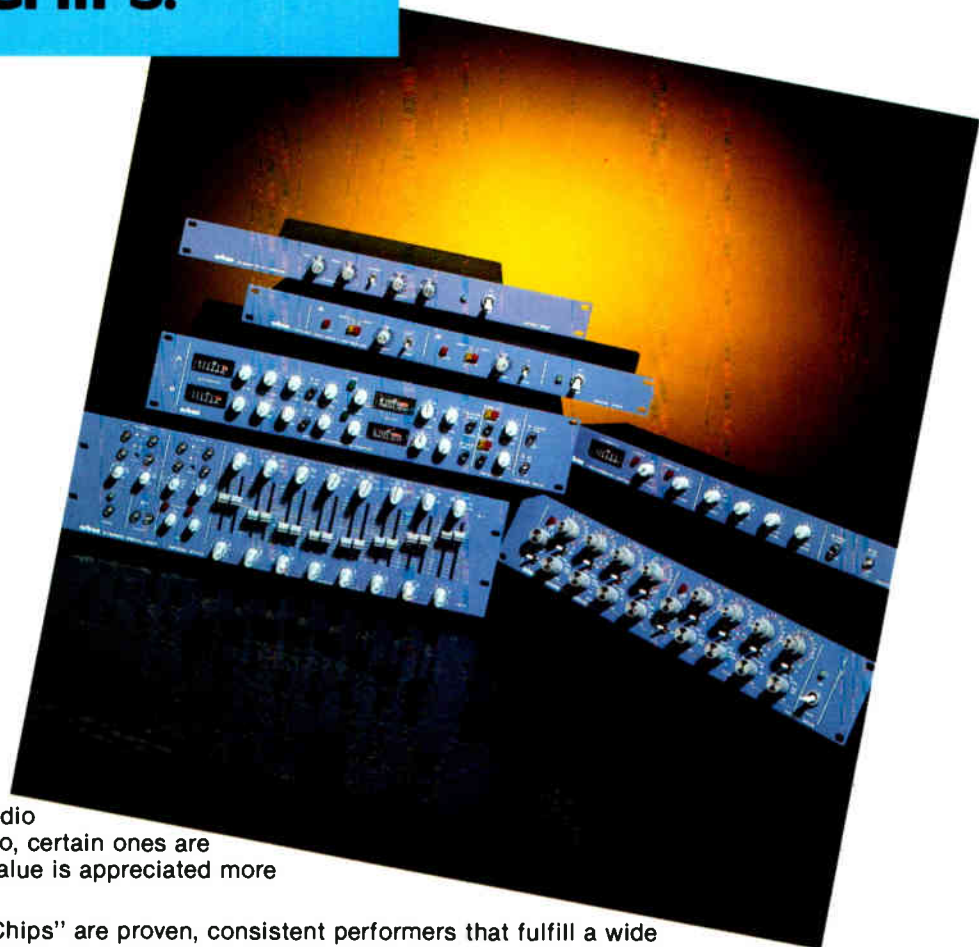
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G R E A T C O M P A N Y

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INSIDER · AUDIO

Numerous error correction codes have been devised. For example, Hamming codes derive multiple parity bits from combinations of the data bits. Simple Hamming codes can be constructed which will detect two errors and correct one error. Similarly, Reed Solomon codes can detect and correct large numbers of errors. Using codes such as Reed Solomon, a digital audio system can detect and correct errors, and supply as-good-as-new information.

However, as we have seen, the performance of the error correction system depends on the nature of the error. For example, what if a large error obliterated both the data, and its parity? There would be nothing left to reconstruct the message. It is thus important to understand the nature of the errors, and devise protection to fit their nature. Errors can occur in large groups, called burst errors, or in isolated instances, called random errors. Digital audio recordings must guard against both kinds; for example a badly formed pit would cause a random error, whereas after eating french fries your fingerprint would cause burst errors. Clearly, burst errors are the most troubling. A good error correction code uses parity, in addition to other processing, such as interleaving.

Interleaving is employed to guard against that all too likely occurrence (of burst errors, not necessarily eating french fries). Interleaving might be thought of as shuffling a deck of cards; data symbols are redistributed in the bit stream prior to recording so that consecutive words are never adjacent on the medium. An error occurring in the medium (such as a dust particle on the disc) might prevent the successful reading of a number of consecutive values. However upon de-interleaving the shuffled words are placed back in their original and rightful position in the stream, and the errors are scattered in time. Thus isolated they are much easier to correct. Interleaving is particularly useful for long burst errors; consecutive errors are scattered by de-interleaving, becoming more like random errors which are more easily corrected. An interleaving example is shown in **Fig. 5**. Interleaving appears complicated, but can be accomplished by simply

delaying the data words by differing amounts prior to recording, and delaying it again (in a complementary manner) upon playback.

Cross interleaving carries the idea one step further. Data is interleaved numerous times, over both short and long time intervals. This provides correctness for larger errors. For example, the Cross Interleave Reed Solomon Code employs parity checking to correct random errors, and cross interleaving to permit parity to correct burst errors.

While error correction of massive errors is possible, it would be impractical to implement. Thus with real-life digital audio systems, some errors are too massive for the error correction scheme. These errors are flagged by the correction circuits, and passed on to error concealment circuits. They employ interpolation methods to examine valid data surrounding the error, and use those values to calculate a new value to substitute for the error. An uncorrected error can be made virtually inaudible by synthesizing new data from surrounding data. Numerous interpolation schemes are used, with different performance levels.

In worst-case scenarios, where the error is so massive that even error concealment would fail, we choose to mute the audio signal. The brief silence is preferable to the burst of digital noise, usually heard as a click. By swiftly attenuating the signal before and after the mute, even these catastrophic errors are often made inaudible to most listeners.

Error correction thus consists of several kinds of processing tasks. Errors must be detected, corrected if possible, or concealed. If necessary, the signal is muted. To accomplish those chores, the signal must be carefully encoded with detection and correction codes, and interleaving. It's a lot of work, but worth the effort.

Now, please refer back to the article in CIRC in the May issue. Hopefully, the pieces will fit together a little better this time around. ■

Ken Pohlmann is an associate professor and director of Music Engineering at the University of Miami in Coral Gables, FL. He is author of Principles of Digital Audio, and The Compact Disc Handbook. He is vice president of U.S. Digital Disc Corp. in New York City.

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—FROM PAGE 12, SESSIONS

ducer **Frank Soukup**. . . Warner Bros. artist **Gary Morris** was in Nashville's **Sixteenth Avenue Sound** to cut tracks and overdubs for a forthcoming album. Morris produced the project himself, with **Scott Hendricks** engineering and **Dave Parker** assisting. . . In Nashville, **Masterstouch Production's** in-house producer, **Wesley Bulla**, finished the final mixes of the new theme song for the Alabama Army National Guard's upcoming "Catch the Spirit" TV and radio campaign. . . Gospel recording artist **Bro. Bobby Albey**, has finished laying tracks down for his album *Stay With Me Jesus* at Nebo, KY's **Trusty Tuneshop** with **Michael Cain** engineering. . . .

NORTHEAST

At **D&D Recording** in NYC, **Dennis Brown** has been working with producer **Willy Lindo** recording his next album. Player/programmer Mac Quayle was brought in for the sweetening and overdubs. **Marc Plati** engineered and **John Leposa** and **Bill Mansfield** assisted. . . At Manhattan's **Green Street Recording**, **Joe Cocker** was in with **Dan Hartman** and **Charlie Midnight**. **Mark Gaide** engineered with **Mark Epstein** assisting. . . At **Third Story Recording** in Philadelphia, **Monnette Sudler** completed final mixes on her latest album, *Other Side of the Gemini*, to be released this fall. The album was produced by **John Wicks** and **Rodney Burton** of Third Story Records. Engineers for the project were **Scott Herzog** and **Dan McKay**. . . After finishing four tracks for the new **Vanessa Bell-Armstrong** album (Jive/RCA) **Backstage Production's** engineer/associate producer **Tom Roberts** was asked by CBS artist **Roy Ayers** to remix five tracks for his upcoming album at the Yorktown, NY facility. . . Activity at **Kajem/Victory Studios** near Philadelphia included sides for **Lou Rawls'** forthcoming LP with **Dexter Wansel** producing, **Mr. Mitch** engineering. . . **The Rhumba Club**, a popular Baltimore band finished up an LP of their world beat music at **GRC Studios** in that city. . . **MediaSound** in NYC had producer **Lenny White** completing an album with the band **Animal Nightlife**, **Alec Head** engineering. . . **Michael Bramon** and **Susan Feingold** produced, arranged and performed music for HBO/Cinemax's *Original Max Talking Headroom Show*, recorded and mixed at **Turnstyle Production's** NYC facility. . . **Pat Metheny** was at **Blue Jay Recording** in Carlisle, MA, producing a score for a television movie in the Ameri-

can Playhouse series. **Rob Eaton** engineered. . . **Aaron "Louie" Hurwitz** engineered and produced the audio mix of a one-hour live TV concert in New Orleans of *The Band* and special guests Allan Toussaint, Bobby Charles, Jo-el Sonnier and Thumbs Carlille. All mixing was done at the **Workshoppe Recording Studios**, Douglaston, NY, and **NRS Recording Studios**, Hurley, NY. . . At **Duplex Sound**, in NYC, **Deodato** produced an LP for **Kevin Rowland** (Dexi's Midnight Runners) for Phonogram UK, right after producing a couple of cuts for **Brenda K. Starr** (MCA) and **Anthony & The Camp** (Jellybean/Warner Bros.). Deodato has also done all the programming and playing on these projects. . . **Island Media** in West Babylon, NY recently had producer **Jack Douglas**, (John Lennon, Aerosmith, Cheap Trick) in to produce the premiere album for the **Lauren Smoken Band**. . . At **Quantum Sound** in Jersey City, **Elisa Fiorello** has been in cutting tracks for her upcoming album with producer **Reggie Lucas**. **Doc Dougherty** has been behind the board with **Mark Polowski** and **Abdu Malahi** assisting. . . At **Cove City Sound Studios** in Glen Cove, NY, **Eddie Montilla** was in recording with **Gerrardo Velez** producing, **Chris Bubacz** engineering, **Tom Yezzi** assisting. . . At **Kennedy Music & Recording** in Philly, a new theme song has been completed for *The Oprah Winfrey Show*. **Steven Ford** provided the instrumentation and also produced the project. **David Kennedy** engineered the sessions. . . **Charlie Lallo** of Hoboken, NJ has written, produced and performed his first music/video, titled *Freedom Forgets*. It was directed by Bill Otterson of Otterson TV in NYC, and the soundtrack was engineered by **Angelo Panetta** of **Panetta Studios** in Elmwood Park, NJ. . . At **Power Play** in Newark, NJ, A&M artist **Glen Burtnik** was in recording for his second LP, *Heros and Zeros*. **Dave Prater** produced the album with the Record Plant's **Grey Russell** engineering. . . At **Quantum Sound** in Jersey City the **Weather Girls** were in doing tracks on four songs for their upcoming album produced by **Reggie Lucas** and engineered by **John Lombardo** with **Michelle Thomas** assisting. . . At **Such-A-Sound** studio in Brooklyn Heights, NY, **Mary Williams** of the Psychedelic Furs was in laying tracks for a new song for a Columbia Pictures film. . . The recently formed Lefrak-Fuhrman Organization in New York has chosen **Harry Hirsch** to produce five CDs of unreleased performances by the **Duke Ellington Orchestra** for their LMR (Little Major Records) label

. . . At **Cove City Sound Studios** in Glen Cove, NY, **Rob Jungklas** worked on his album, **Lenny Kaye** producing, **Rod O'Brien** engineering and **Tom Yezzi** assisting. . . At **Duplex Sound**, NYC, MCA recording artists **Breakfast Club** were in remixing "Rico Mambo" for a future single release, with **Deodato** producing, and **Mallory Earl** mixing. . . **Lou Rawls** was in Philadelphia's **Sigma Sound** working on a new album for Philadelphia International Records. Producers were **Kenny Gamble**, **Leon Huff** and **Bunny Sigler**. The project was engineered by **Joe Tarsia** with **Dave Saia** as his assistant. . . At **1020 RPM** in Philadelphia, **Cindy Faith** was in recording her latest single. **Chris Gately** was at the board, with **John Wicks** producing. At **Third Story Recording** in Philadelphia, **Parrish Blue** completed final mixes on its latest album, *Western Roads*. **Dan McKay** and **Scott Herzog** engineered and produced, along with co-producer, band member **Charles Crystle**. . . At **Trackmaster Audio** in Buffalo, NY, work was done on the latest album project for Planet Records artist **Thelma Houston**. Production was handled by **Richard Perry** and **Lemel Humes**. Engineering on the project were **D.M. Bellanca**, **Jim Calabrese**, **Mike Sak** and **Paul Gold**. . . **Showstoppers Studios** and **Sadler Recording** (NYC) have completed a joint venture for Bad Cat Records' new album by **Jimmy Norman** of The Coasters. It was produced by **Dr. Debbie Colony** and engineered by Dr. Colony and **Rick Klejmont** of Sadler Recording. . .

SO. CAL/HAWAII

At **Take One Recording** in Burbank **Was Not Was** was in with **Don Fagenson** producing. **Paul O'Duffy** was the co-producer, with **Martyn Phillips** engineering and **Micajah Ryan** assisting on the new album for PolyGram Records titled *Walk the Dinosaur*. . . At **Image Recording** in Hollywood, Studio A has been hosting producer **Richie Zito**, mixing tracks for **Kenny Loggins**. **Phil Kaffel** was at the desk with **Steve Krause** assisting. . . Warner Bros. recording artist **Morris Day** was back in **Encore Studios** in Burbank working with Roman Johnson of the Gap Band on keyboard tracks and also completing vocal overdubs for his forthcoming album. **Judi Day** produced with **Randy Tominaga** engineering. . . Producer/composer **Jon Lyons** produced the official theme song for the 1987 International Special Olympics,

—CONTINUED ON PAGE 306

RECORDING

WHAT YOU DO WITH THE M-600 MIXER IS YOUR BUSINESS.

That's why we've designed it to meet or exceed your most demanding requirements. And made it the easiest, most flexible professional mixing console you'll ever work with.

The M-600 is modular. Which means you can custom configure the console to *your* audio or video production needs. The M-600 lets you choose up to 32 input channels, or you can start with 16 or 24 input channels and expand the board as your needs change. Optional stereo modules can also be added to provide even more line inputs for MIDI instruments and video production convenience.

Installation and wiring is exceptionally easy. The M-600 is the only modular mixer that's available with all the necessary finished cables and installation hardware. And that can eliminate a lot of installation hassles and expense. At the same time, no other mixer at its price gives you multi-pin, computer-type connectors for quieter, more secure connections.

But the real pleasures of the M-600 will only be evident after it's in your studio. Up to 64 stereo or 128 mono inputs can be accessed directly from the top panel. A patch bay can be added for fast, flexible routing. That's convenience.

The M-600 has all the features you'd expect in a professional mixing console. Like balanced insert patch points on all inputs, PGM busses as well as the stereo master buss for increased signal processing capability. Plus sweep-type parametric EQ, balanced inputs and outputs, phantom power, talkback/slate channel and all the audio performance you'll ever need. Without the exorbitant price you don't need.

So check out the M-600 modular mixing console. It's ready for fame when you are.



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The Tape

The Synclavier® Digital Audio System and the Direct-to-Disk™ Multitrack Recorder combine to form The Tapeless Studio, a complete computerized recording environment for music and post-production. The heart of The Tapeless Studio is the proprietary high speed Synclavier computer, which integrates and controls the functions of a diverse array of hardware and software for the generation, manipulation and storage of sound.

The Synclavier system's outstanding power, speed, and ease of use derives from the computer's unmatched ability to address massive amounts of digital sound data. A maximum configuration of 8 gigabytes of on-line storage offers the largest capacity of any system of its kind.

Synclavier memory can be configured to match your specific requirements.

Winchester hard disks provide on-line "workspace" for songs in progress and libraries of frequently used sounds. High density floppies are used for storing individual projects, sound libraries and installing factory software updates, while 15 Mb streaming cartridges provide hard disk back-up. Optical Disks offer a full 2 gigabytes of memory for mass on-line recording storage of sound data.

Random Access Memory is used for the recording, editing and playback of short instrumental sounds or sound effects: 32 Mb are available, again the



largest of any audio system. Additional system RAM provides storage for the 200-track Memory Recorder — maximum size is 8 million note/events.



Synclavier user interfaces include the computer terminal, mouse controller, the 76-note velocity/pressure keyboard, and the optional Digital Guitar. System interfaces such as the MIDI, SMPTE, Multi-Channel Output Distributor and external timing modules may also be added.

Software updates keep the Synclavier system at a state-of-the-art level. Recent enhancements make available advanced features like cut-and-paste editing for the Synclavier Memory Recorder, mouse-based editing for sampled sounds, engraving quality Music Printing, database organization of archived sounds, and full SMPTE and MIDI editing capabilities.



less Studio™

The Direct-to-Disk Multitrack Recorder, featuring unsurpassed 16-bit/100kHz fidelity, can now be configured in stand-alone 4, 8, and 16-track units. It records and plays back audio information from a dedicated network of Winchester hard disks, and backs-up on convenient, reliable data cartridges. Direct-to-Disk also incorporates its own SMPTE synchronizer and MIDI interface.



Like the Synclavier, the Direct-to-Disk system is based on proprietary computer hardware and is software updateable. Current software implements advanced non-destructive cut-and-paste style editing. A maximum continuous recording time of over 3 hours is available at a sampling rate of 50 kHz with a 16-track system.

The Tapeless Studio™ has been designed as a modular, open architecture system, which can be expanded as your business grows and as new technology becomes available — while protecting your original investment in the system and in the time spent learning its operating procedures. New England Digital provides comprehensive training for you and your staff.



Technical assistance and service are available on-site or by phone from any of our offices worldwide. There are company-owned sales, service and training offices in Los Angeles, New York, and Chicago, with branch offices in Nashville, Toronto, France, Great Britain, West Germany and Japan, in addition to our corporate headquarters in Vermont.

We recognize that when you make a significant capital investment in equipment, you are also, in part, investing in a company. New England Digital is a research-oriented, American computer company dedicated to a single goal: building the finest computer-based digital audio systems for the music, recording and post-production industries.



by Tony Thomas

STUDIO FINANCING

AN INTERVIEW WITH BOB SKYE OF THE PLANT • SAUSALITO, CA

Recording is a capital-intensive business. A *very* capital-intensive business. While many other entrepreneurs can start up with little more than a desk, typewriter, calculator, filing cabinet and wastebasket, starting a recording studio necessarily requires the acquisition of many thousands, if not millions of dollars, worth of equipment.

Putting together that amount of financing requires either immense personal resources, or a great deal of financial savvy. First of all, a prospec-

tive studio owner must learn how to put together an appealing business plan, complete with financial projections and net worth statements, to interest potential investors and/or bankers in getting involved. This almost always requires an intensive educational process, as bankers and investors are seldom acquainted with the inner workings of the studio business and its overall profit potential.

Next, the prospective owner must acquaint himself or herself with all of

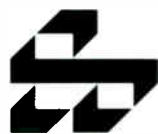
Bob Skye, owner of The Plant Recording Studios, discusses final mixes with client.



PHOTO MICHAEL FREEMAN

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STUDIO · VIEW

the available financing options, and weigh the pros and cons of each. Finally, after weighing all the options, it is incumbent upon the prospective entrepreneur to determine whether or not the new enterprise will be able to generate sufficient profit to offset the capital invested. If that cannot be done comfortably, then the numbers must be revamped and the business plan modified accordingly.

Simply stated, getting financing is not easy. In fact, it is often said that the only people who can get financing easily are the ones best able to prove they don't need it!

Bob Skye, the present owner of The Plant in Sausalito (formerly the Record Plant) has, of necessity, become an expert on financing. He parlayed his ownership of Skyelabs, a remote recording bus, into a full-service audio recording facility. Skye, who began his career as a musician during the psychedelic era, soon found that there were many more talented musicians than people who were good at recording them. He then switched over to the other side of the console and has

been there ever since.

Although Skye began his career as an engineer, he describes his work in the industry as "pretty multifaceted." "I found myself," Skye recalls, "being thrown into situations where I was called upon to take a project that was in progress and put together the right people to make sure that it turned out professionally." Skye acquired The Plant "because the numbers were right and I needed a place to park my bus." Skye spoke to *Mix* recently about studio financing and the various options available:

Mix: What should a studio owner think about when deciding to purchase a piece of equipment?

Skye: Well, first of all, you have to have a reason to buy. You have to ask yourself: does the business warrant the purchase of that particular piece of gear? Do the clients want it? If the client's don't want it, somebody better want it that has a lot of money to pay for it. I was on a panel at a NARAS seminar and David Schwartz [publisher/editor of *Mix*] said something that summed it up very well. David said that, unlike any other time in history,

a recording studio has to be managed like a business. Studio owners have to observe standard business practices relative to accounting and profitability. You have to have a long-range business plan. Our business plan at The Plant is for the next ten years. I think that any studio that doesn't have a business plan—one that takes into consideration equipment purchases vs. profit margins—is being very shortsighted.

"Unlike any other time in history, a recording studio has to be managed like a business. You have to have a long-range plan."

Mix: When does it make sense to buy a piece of equipment and when does it make sense to lease it?

Skye: OK, let's say we have decided to acquire a piece of equipment. It's something that we need and that can be justified financially. The first thing we have to do is look at what advantages we have under the tax law. Well, as you know, the tax laws have changed, so many things are now different. [*Mix* strongly suggests that you contact a qualified professional such as a CPA or tax lawyer to determine your tax status under the new law before contemplating the acquisition of any major piece of equipment.] Based upon the way my business is structured, it makes sense for me to purchase the gear with loan financing instead of a lease. Of course, every situation is different.

But, if leasing makes sense, you have to look at the lease contract and see if there is a buyout amount at the end of the lease. If there is a buyout, how much is it? Is it based upon depreciated value or is it a percentage of the original cost? If you are borrowing the money, you have to look

—CONTINUED ON PAGE 307

**AURASONIC'S
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POSSIBILITIES
IN SIGNAL
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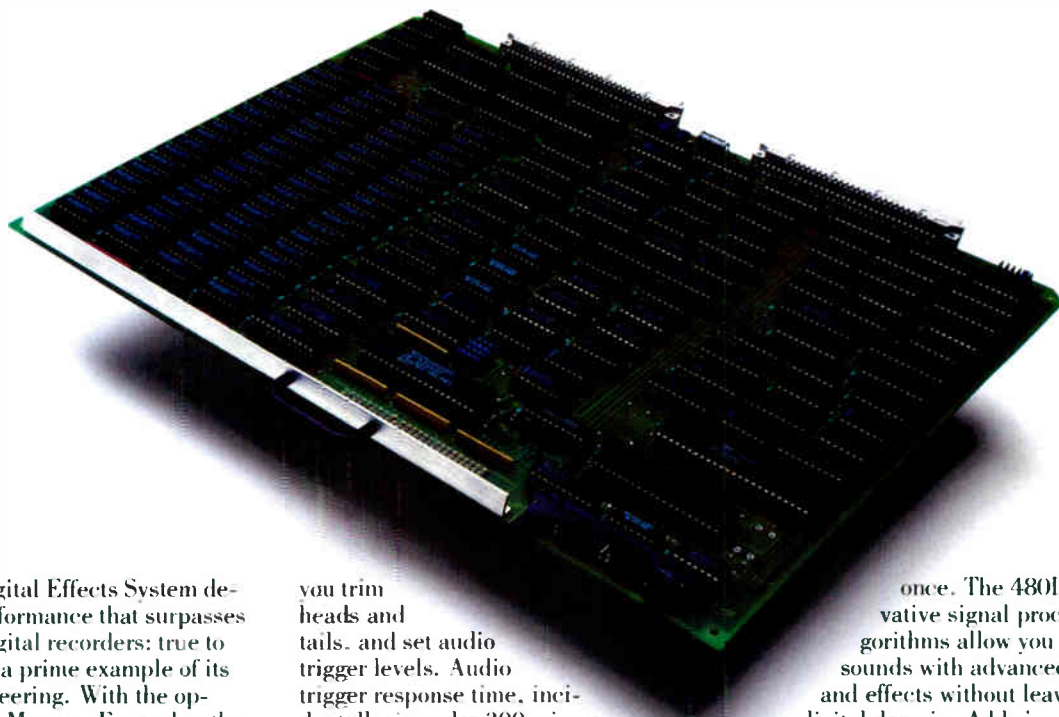
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EXPANDING THE SYSTEM

*The 480L Sampling Memory Expander. Accurate sampling in phase-locked stereo:
a Lexicon applications brief.*



The 480L Digital Effects System delivers audio performance that surpasses conventional digital recorders: true to life sampling is a prime example of its advanced engineering. With the optional Sampling Memory Expander, the 480L becomes an astonishingly practical way to copy or move several seconds of audio from point A to points B and C.

Until now, "flying in" or "slipping" vocal and instrumental overdubs meant tradeoffs. Two-track tape is clumsy and degrades the signal: DDLs with long memories are better, but not by much. Now, with the 480L's optional Sampling Memory Expander, you can digitally record 10 seconds of true phase-locked stereo or 20 seconds of mono at a 48 kHz sampling rate. 18 bit equivalent A/D conversion produces a typical dynamic range of 98 dB, with a bandwidth of 20 – 20,000 Hz: output doesn't get any closer to input.

If you're using a digital recorder that's Sony 1610 compatible, the Sampling Memory Expander and the 480L's digital I/O interface can reproduce the original performance at any location on tape without leaving the digital domain. Slip syncing, copying and time shifting of audio segments is faster and cleaner than ever before.

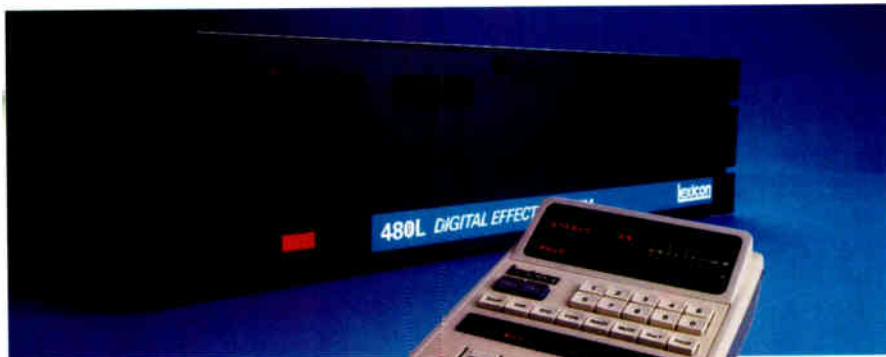
You control sample recording, editing, processing and triggering from your work position using the 480L LARC. Varying up to six parameters at once,

you trim heads and tails, and set audio trigger levels. Audio trigger response time, incidentally, is under 300 microseconds — virtually instantaneous. Sampling Memory Expander enhancements include Record Trigger to trigger sampling automatically from audio input, Time Variant Record, and sound on sound digital recording in sync with the original sample. Lexicon Dynamic MIDI® lets you assign MIDI controllers to sampling parameters, for new dimensions of real-time or sequenced control.

Sometimes even the most accurate replica isn't exactly what you're looking for: if so, the 480L will take you beyond imitation into creative sampling. Play samples faster or slower (without changing the sampling rate), backwards or forwards, even both at

once. The 480L's innovative signal processing algorithms allow you to enhance sounds with advanced reverbs and effects without leaving the digital domain. Add signal processing as you sample, or process a "dry" sample on playback with digital wet-dry mixing.

The 480L digitally integrates sampling and signal processing because it's designed as a comprehensive audio production tool: a system. Aud sampling is only the first of many directions in which this Digital Effects System can grow. We're continually examining the possibilities, and as your needs develop we'll implement new tools to meet them. Now is the time to call your Lexicon Advanced Products dealer for a demo of the new production techniques the Sampling Memory Expander makes possible.



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SUPER-SONIC TRANSPORT

Fast, accurate and powerful. Someday, all audio machines will be built this way, but consider what the MTR-90's advanced technology can do for you right now.

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ANALOG TAPE RECORDER ELECTRONICS

A Road Map For Maintenance Engineers

BY GREG HANKS

The process of reproducing sound from a recorded tape is very similar in function to the operation of a hydro-electric generator. They both operate on the principle that when a magnetic field cuts across a wire, current flows in the wire. The recording process works using the inverse of the principle: when a current flows in a piece of wire, magnetic lines of flux are created around that wire. Magnetic tape is composed of very fine particles of magnetizable material glued onto a long chunk of plastic. In the recording process (where analog audio is concerned), these particles are magnetized along the plane of travel of the tape. They are stacked perpendicular to the plane of travel across the face of the gap that contacts these particles. When these stacks of horizontally polarized bar magnets travel across the face of the reproduce head, the lines of magnetic flux that surround them are carried by the head across a winding inside the head, and a current flows in that winding. That current is our audio signal, and getting it on and off the tape with the least amount of destruction is our goal.

HOW HEADS WORK

Reproduction

The playback head is a transducer that changes the magnetic flux reversals of particles on tape moving past it into electrical signals. This can be viewed simplistically as a transformer that uses magnetic tape in motion across the core gap (pole pieces) as the primary winding. The head is an inductive source. This means that with a constant flux level presented to the pole pieces, the frequency response rises at 6 dB

per octave. The output of the head is similar to that of a miniature generator, and it is important to note that the voltage generated not only is proportional to the amount of flux, but also to its rate of change. This results in the same response curve as you get with a capacitor in series with a load, but with a major difference. With a capacitor in series, you have 90 degrees of phase shift, but with the head, there is no accompanying phase shift. Because of this response, all tape reproduce pre-amplifiers start with a falling 6 dB per octave response, which mandates an included 90-degree phase shift. The equalization curve necessary to accomplish conformance to the appropriate standard is then applied to this

falling 6 dB/oct. curve. Seems simple enough, right? See the sidebar on EQ curves for an explanation of why most published curves look the way they do. If the output of the head is rising at 6 dB/oct., then why is there high frequency boost applied to the record signal, and why are the EQ curves so different for different speeds? Well, the reasons are based in trying to overcome the "losses" that are an integral part of the record/reproduction chain. Among these are: gap loss, azimuth loss, spacing loss, thickness loss, head bump loss and eddy current loss.

Gap Loss: This is probably the most widely comprehended loss in the reproduce chain. The head responds to the changing magnetic pattern on the tape as it is moved across the head. When the wavelength is equal

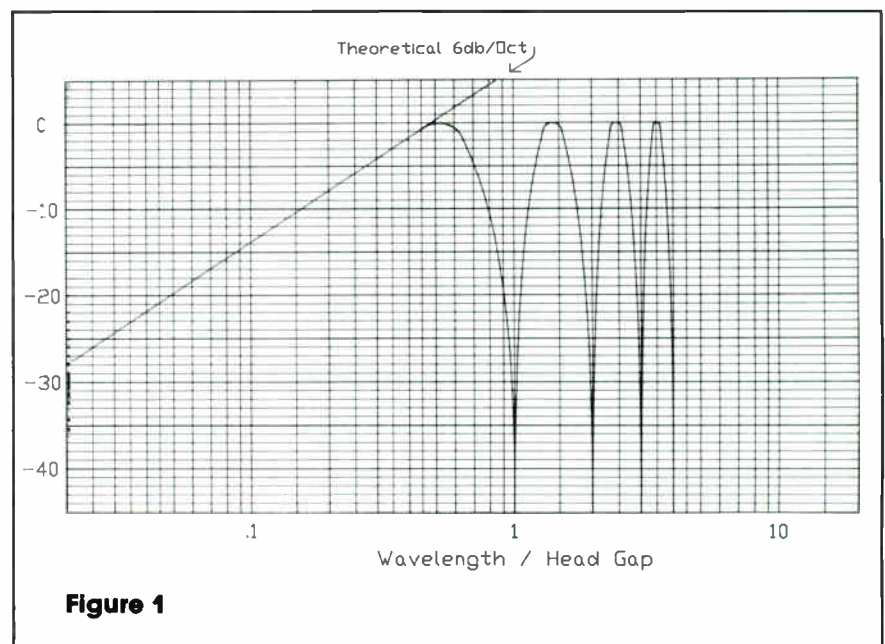


Figure 1

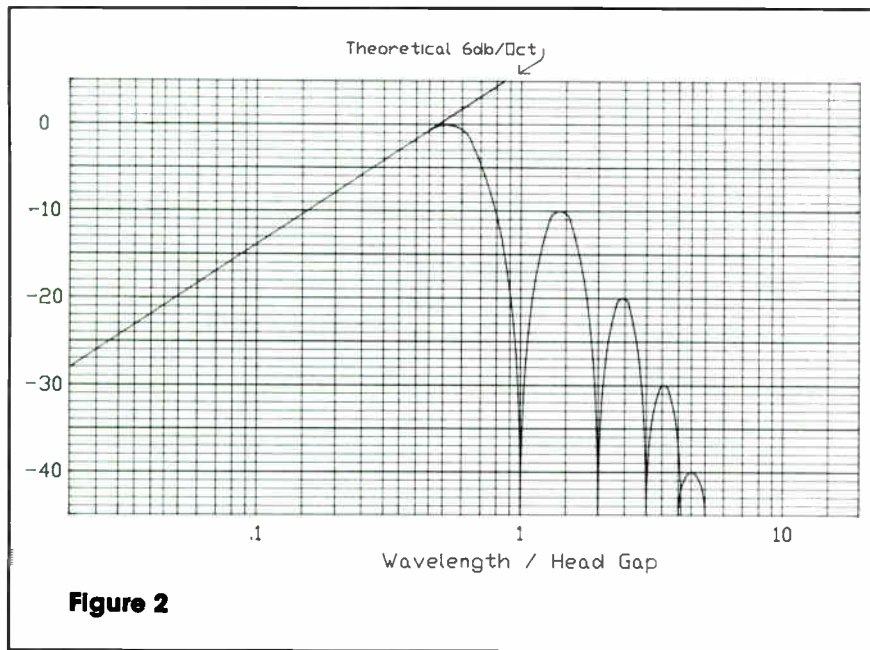


Figure 2

spacing of 25 micro inches (.000025) will produce 11 dB of loss at 15 kHz. The formula for calculating this loss is: Spacing Loss (in dB)=

$$55 \times \left(\frac{\text{distance}}{\text{wavelength}} \right)$$

Spacing loss probably is the most significant element that a techie will deal with. It rears its ugly head in many forms. Most of the time, spacing loss occurs because of incorrect head rotation coupled with wear of the head at the gap. This can be corrected "in the field," whereas the majority of other types of losses mentioned here are a function of head manufacture. Spacing loss appears in other ways, such as registration error. The manner in which this usually distinguishes itself is in "meter bounce," although this also occurs with racking error mentioned above. Registration error is the same thing as head height errors between the recorded track and the reproduce head gap location. Registration error common to all tracks in a multi-track head can be corrected by changing the height of the head, whereas the situation where only a couple of tracks are off can be corrected only by head replacement. When the reproduce head track width is not centered on the recorded track, there is less total flux available to the reproduce head, and the overall signal level is reduced.

Thickness Loss (Revisited): When the tape is recorded, the oxide coating depth is completely penetrat-

to the gap size, the output of the head is zero. This is the familiar function:

$$\frac{\sin X}{X}$$

The response that accompanies gap loss is shown in **Fig. 1**.

Azimuth Loss: It is well known that the high end will get a bit muddied when the playback head is on a tilt. This is known as azimuth loss. The reason the top end disappears is that this is a wavelength-sensitive loss. The mechanism of the loss is best explained by remembering that the amount of current which flows in the head winding is proportional to the amount of flux differential which appears across the gap. When the head is not perpendicular to the plane of travel of the "line" of magnetism (remember, there is a line of magnetic particles perpendicular to the travel of the tape), then there are fewer particles contributing to the differential of flux at the gap. The amount of loss is greater when the track width is larger. It also is greater when the wavelengths are shorter. The formula that describes this loss is:

Alignment Loss (in dB)=

$$20 \text{ Log } \frac{\sin \frac{\pi \times \text{width} \times \tan \text{ angle}}{\text{wavelength}}}{\frac{\pi \times \text{width} \times \tan \text{ angle}}{\text{wavelength}}}$$

See **Fig. 2**

Azimuth error makes itself obvious with wider track widths, such as half-inch 2-track format. With a 24-track

machine, the azimuth can be out as much as 360 degrees between tracks one and 24, and high-frequency attenuation due to that error is negligible.

Thickness (or Coating) Loss: Thickness loss is the primary deficiency that reproduce equalization is meant to overcome, and to understand it, we first must explain spacing loss.

Spacing Loss: Spacing loss occurs when the magnetic oxide of the tape is not in contact with the gap of the head. This loss is wavelength-dependent. For a given separation distance, the shorter the wavelength, the greater the loss. Consider the case of the cassette—the tape speed is slow and the high frequencies have short wavelengths, so a

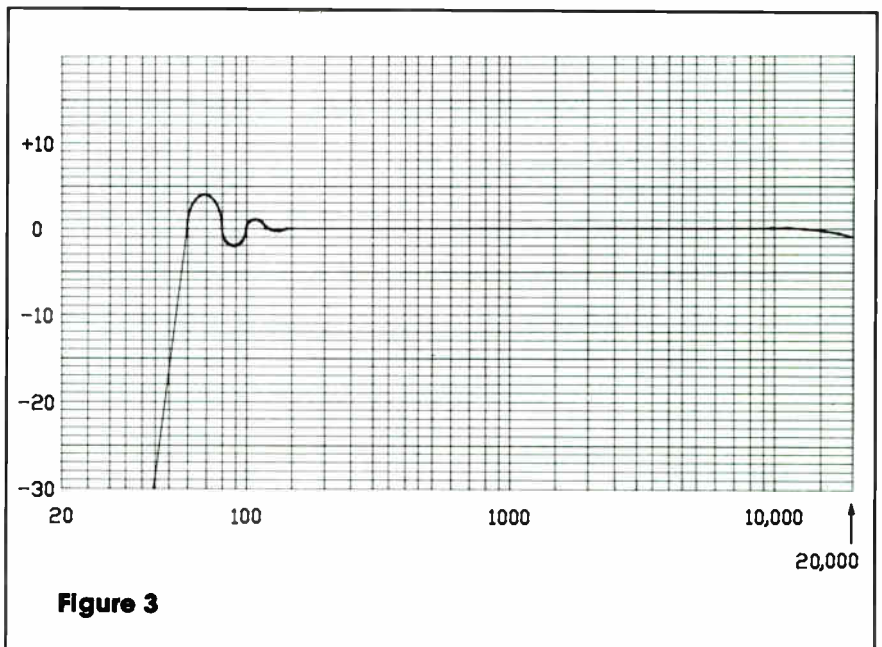
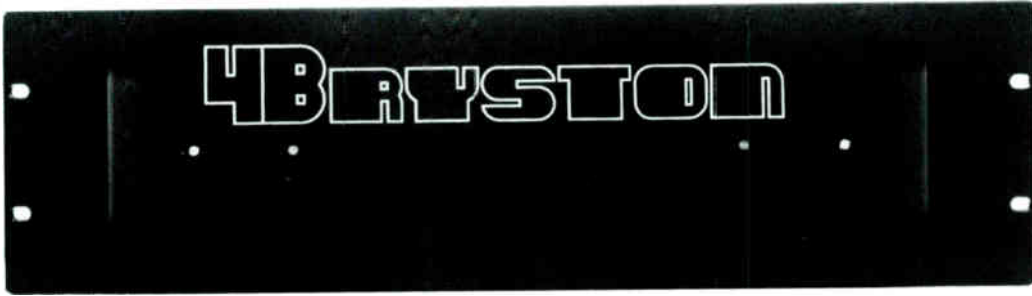


Figure 3

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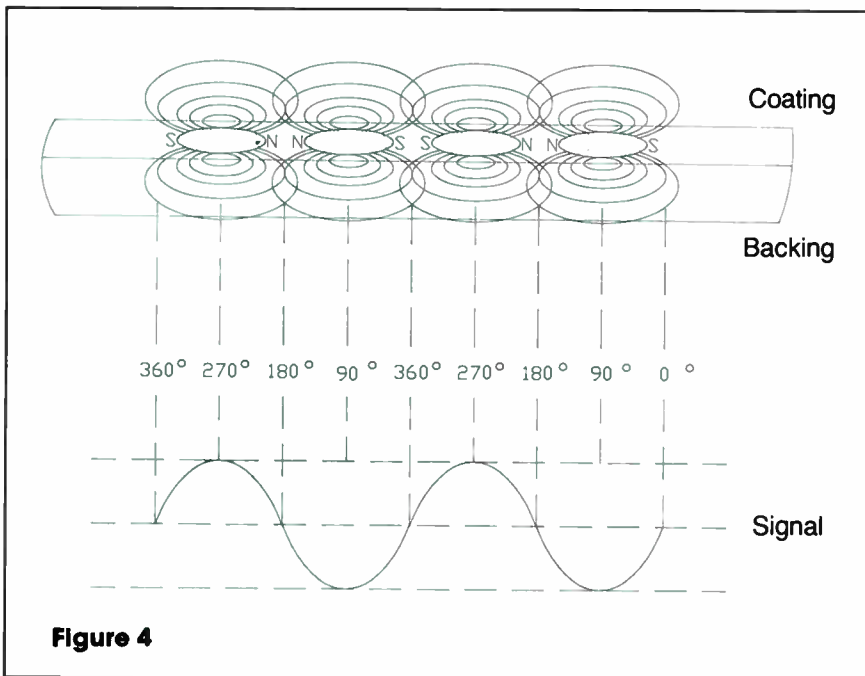


Figure 4

ed by the bias field. Thus, the entire depth of the tape is recorded. When the tape is played back, the flux field(s) of all the "layers" of the magnetic particles that comprise the tape contribute unequally to the reproduced signal. Because of the spacing loss phenomenon noted above, only the longest of wavelengths fully contribute to the reproduced signal, with only the surface layers of magnetized particles contributing to the high frequency reproduction. This gives us a falling frequency response that is tape speed-dependent. It is this high frequency loss that both reproduce and record equalization are meant to overcome. The slow-

er the speed, the shorter the wavelengths and the more thickness loss we have. The above loss illustrates why newer chrome tapes have better top end. The tape surface is now much smoother than older tapes, and this means the oxide can have much more intimate contact with the head.

Eddy Current Loss: In the reproduce chain, this loss probably contributes the least to the difficulties of getting quality reproduction of music. Eddy currents are created by the lines of flux generated by the windings of the head. When the flux from the tape is converted into electrical energy, this generates a current flow in the wind-

ing. The current flow in the windings of the head causes lines of flux to be generated around the winding, and these are coupled into the core, and around and around it goes. The net result is that the flux (at high frequencies) is confined to the surface of the core. Modern heads consist of many laminations of core material. This reduces eddy current losses by increasing the number of surfaces, thus increasing the amount of available flux. The net result: the slope of the rising response of 6 dB/oct. is reduced to 5½+ dB/oct. Typically, this results in ¼ to ½ dB loss at 20kHz. This is a frequency-dependent loss, so is unnoticeable at lower speeds, while observable at 15 and 30 ips.

Head Bump Loss: When the recorded wavelength on tape approaches the overall dimensions of the two head pole pieces, the pole pieces begin to act as a second gap. This leads to a rise in the output of the head. When the wavelength is twice the length of the contacted pole pieces, there is a maximum addition of available flux. Conversely, when the wavelength is equal to the combined "second gap," we have a cancellation of output because the additional flux output is zero. The resulting curves can be seen in **Fig. 3**.

Recording

Getting the signal back off the tape is much more difficult than getting it on there in the first place. The recording process operates on the principle that when a current flows through a winding, lines of flux are generated around that winding. These lines of flux are carried by the pole pieces of the head to the surface of the tape. There is a gap perpendicular to the travel of the tape, and this gap has a magnetic field across it that is polarized along the plane of tape travel. Being that we are glossing over the basic physics principles of the recording process, I will simply state that obviously we are all well aware of the non-linearities of tape, and thusly are cognizant of the role of bias in the recording process. Recording takes place at the trailing edge of the gap, and not across the gap itself. The above mentioned phenomenon is what accounts for the drastic phase shifts that occur in multi-track machines with their bias aligned at 1kHz or below.

Let me move into a discussion of the losses that affect the recording

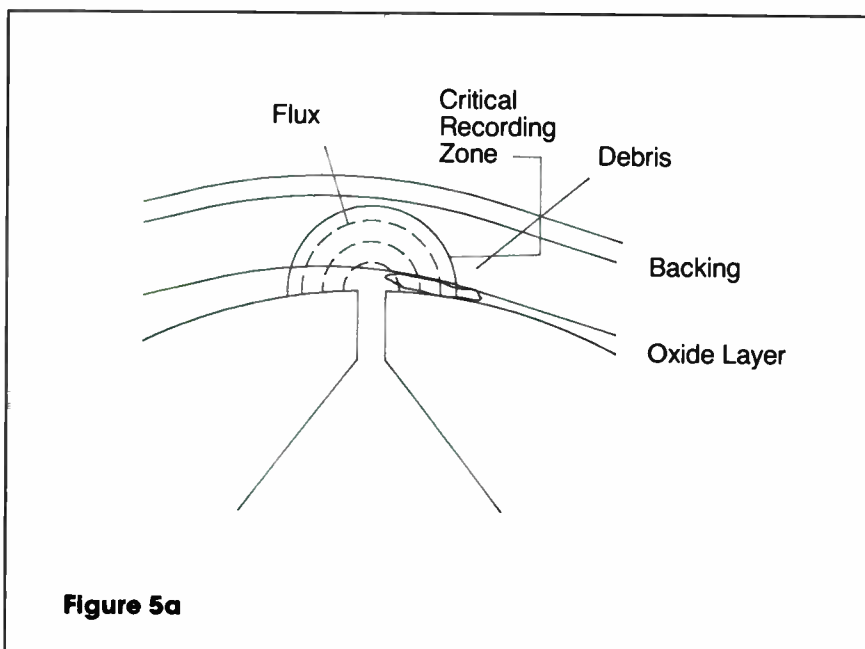


Figure 5a

Maintenance Experts on ATR TLC

There you are, midway through a session, when the lightbulb that senses your multi-track's tape tension suddenly goes dark. The machine isn't happening, there's a ticked-off producer glaring at the clock, and you've got to call a service tech to deliver and install a 15-cent part—for 50 dollars!

This need not happen in your studio. Indeed, there are many ATR woes that needn't needle you. As with any mechanical device, one problem leads to another, and then another, so try to catch the first problem ASAP. Which means: routine maintenance is mandatory. Proper interconnections help keep things running properly; by managing grounds in the studio, you can keep elevated chassis voltages to a minimum. Also, the control room should be as clean as grandma's sitting room.

Generally, treat your machine with the respect that you give to clients, for without one, you would not have the other. Specifically? We asked some audio gear maintenance engineers and technicians to tell us how studios can help lengthen the lives of their analog, multi-track tape machines.

Offering their advice are electro-acoustic engineer Rob Rosati of EARS in Boston; sound engineer Rob Forman of Tekcom Corp. in Philadelphia; maintenance engineer Chip Garrett of Studioworks in Charlotte, NC; Ian Budd of the Cincinnati-based ICB Audio dealership; audio engineer Tim Delaney of EAR Professional Audio/Video in Phoenix; former studio engineer Ron Oren of Mirromere Audio, a supply and maintenance service in Wheatridge, CO; and former Ampex audio design engineer Jim Hartley of J.L. Hartley Pro-Audio Support (fac-

tory-level motor refurbishing) in Fremont, CA.

Rosati/EARS: Have a qualified technician periodically look at the machine in depth. Every day, the assistant or house engineer should thread a calibration tape onto the machine and monitor for proper record and reproduce levels. Plus calibrate the tape deck to match another deck or a specific tape formulation. If you monitor the deck daily, you'll readily pick up any change, which usually means a problem occurring or about to occur.

Periodically check for dust accumulation in places like the power supply. A slight dust coating on a power supply acts like a blanket and lets the unit run at very elevated temperatures, which will cause major problems in a short period of time. In the room that holds the deck, it's important to keep the ambient temperature very constant, around 68 degrees. The environ-

—CONTINUED ON PAGE 203

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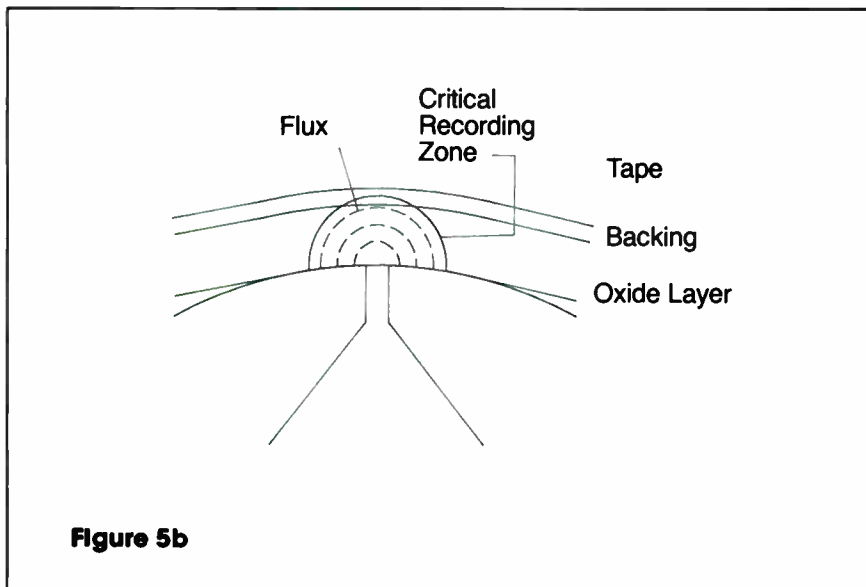


Figure 5b

process, to better illustrate the reasons for the equalization that we apply.

There are a number of losses that occur in recording as well as reproduction, including demagnetization, bias erasure, eddy current (revisited) and spacing (revisited).

Demagnetization: When recording takes place, we are orienting and magnetizing the magnetic particles (rust) that are glued onto the tape. Refer to **Fig. 4** for a simplistic picture of a representative magnetic flux pattern on tape. Upon inspection, we see the patterns from one group of parti-

cles interact with adjacent groups of particles. This occurs in both longitudinal and perpendicular magnetization. The result is a reduction of the flux available to the head. The demagnetization loss for longitudinal orientation is greater at short wavelengths, and perpendicular losses are greater for long wavelengths. A bell-shaped curve is the result. Modern tapes use longitudinally oriented particles, so the predominating loss is at shorter wavelengths. Low frequency boost is the result of demagnetization losses. The formulae that describe this

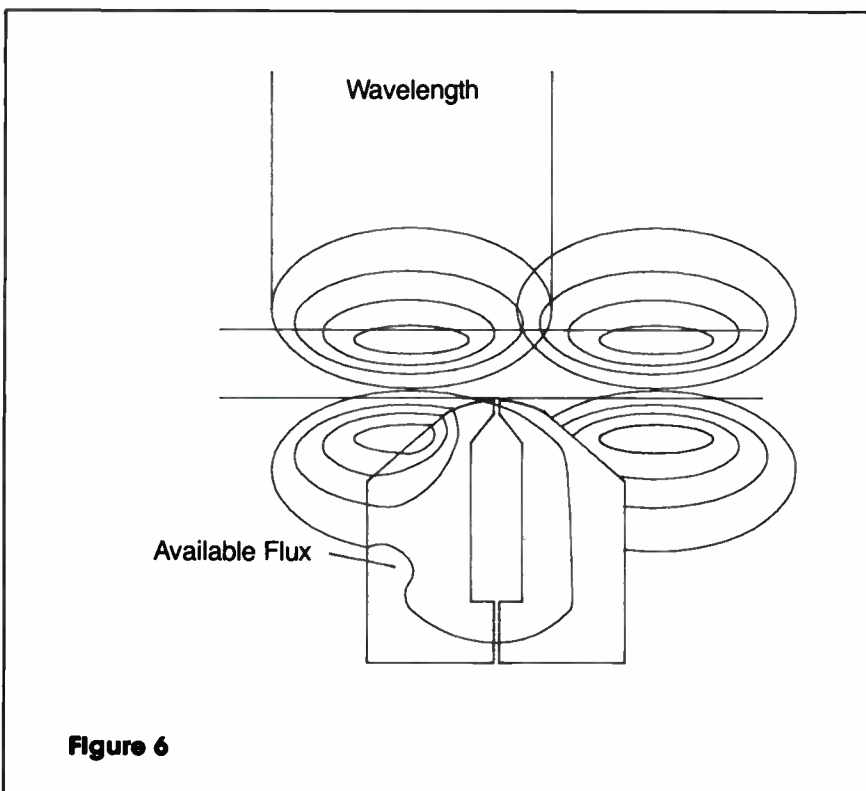


Figure 6

loss are lengthy, and can be found in the IEEE transcripts authored by Shun-ichi and Neal Bertram.

Bias Erasure: This is the phenomenon whereby the short wavelength signals (top end) are reduced in level more rapidly than the long wavelength signals with increasing bias current. There are a number of different explanations for this occurrence. Some early investigations explain the process by mapping the geometry of the bias field at the gap, and state that the shape of the bias field at the "trailing edge" of the head (or "transition zone") is responsible for the reduction in high frequencies.¹ Let me take a step back, and note that the recording process takes place as the tape exits the head where the bias field is decaying past the remnance point of the tape. There is a zone where the bias level is at a flux level which no longer will re-orient the magnetic domains of the particles of the tape. This is called the recording zone. If the bias field is of a geometry that allows this zone to be large in relation to the wavelength of the recorded signal, then the resultant flux is reduced to zero. It has also been said that it can be viewed as though the short wavelengths are being pushed into the tape coating, and that thickness loss prevents the signal from being available to the reproduce heads.²

Eddy Current Loss (Revisited) and Core Permeability Loss at High Frequencies: Eddy currents can be defined as the circulating currents within the core of a magnetic head. They flow in the same direction as the core windings and, if permitted to circulate unhampered, would behave as if there were a number of shorted turns within the core. Such a short circuit would dissipate a considerable amount of energy and decrease the head's efficiency. It can be said that these losses are best visualized as a reduction in the cross-sectional area of the pole pieces, which reduces the amount of flux-carrying area, resulting in a loss of signal. Eddy currents limit the penetration of flux lines into the core center and the flux lines are confined to the core surface. As the frequency increases, this sheath of flux-carrying material is no thicker than the skin depth of the core material. A laminated structure is used in most magnetic heads to increase the number of flux-carrying sheaths.³ Eddy currents increase with frequency. In the recording process, eddy currents limit the

amount of current available to the windings, because of the increasing impedance of the head. This results in a loss that increases with frequency. Core permeability loss at high frequencies is not as well-known as eddy current loss, but contributes to its effect. In practice, the permeability of metal heads changes with frequency, partially due to eddy current losses, and partially due to core permeability loss. This results in the head changing inductance as the frequency increases. The slope of the high frequency losses is increased by the coupling of these two losses combined. (Ferrite heads do not show decreasing permeability at high frequencies, and the eddy currents are negligible, which illustrates why there are often difficulties in the simple exchange of ferrite heads for metal heads in the record chain.⁴) The end result is 15 to 20 kHz being down in record, all other factors being equal. The only corrective action possible is the replacement of the head with a different type showing lower losses. Modern studio recorder heads do not usually demonstrate this property, and if they do, the integrity of their manufacture is suspect.

Spacing Loss (Revisited): The geometry of the bias field is one of the determinants of the high frequency response of the recording chain. Spacing loss in the record side of the system, whether caused by debris or a film of air, results in a dynamic change of the shape of the recording zone. The effect of this change is the same as "under-bias," which results in an increase in distortion, and an elevation of the high frequencies. See Fig. 5.

So now you see how difficult it is to get audio on tape, and how much more difficult it is to get the stuff back! Enough about losses. Let's get into some of the meat and potatoes issues that we face every day.

Operating Level

One of the more confusing aspects of studio life for the aspiring "Techie" is the mathematical relationships of "standard operating level." I am frequently asked why the 250 nW/m² test tape is called a +3 operating level, when the standard operating level is 200 nW/m². Also, is "+6" 6 dB above 200, or +3 above 250, or is it based upon a European reference level? Well, I hope that the following list and explanations of the most commonly used reference levels will explain some of



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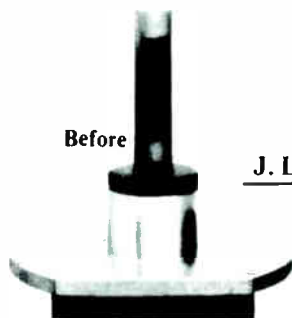
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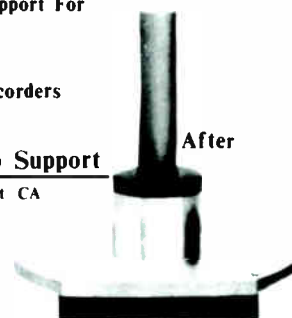
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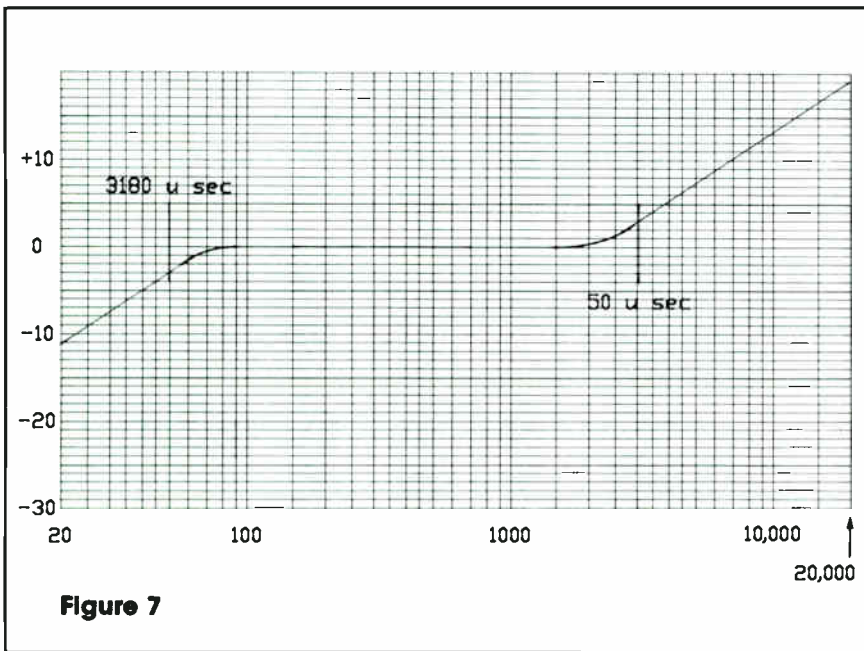


Figure 7

the confusion. There are a number of standards adhered to, including:

NAB: The NAB operating level was specified as -8dB below 3% distortion using an "appropriate tape" (such as Scotch 111). There was no fluxivity specified, but it generally fell in the 160 nW/m² range. This has evolved into the current 160 nW/m² specification used by the NAB for the tape cartridges commonly used in broadcasting. (Most broadcasters are now using 200 to 250 nW/m² as their "in-house" operating level.)

185 nW: This is the original "Ampex operating level," established as the amount of flux per unit area that was -6dB below the 3% distortion level of the tapes in common use at that time. This fluxivity refers to a 700 Hz tone recorded at 7½ or 15 ips where the playback head pole pieces cover the full recorded track. Mono machines were the norm, and this operating level and the test tapes utilizing it were fully sufficient for the purposes of alignment. This level has also been adopted by the NAB for the purposes of 7½ and 15 ips open-reel formats. There are no compensations employed in the test tapes that use this level.

200 nW: Magnetic Reference Laboratories introduced this as a means of conforming the reference fluxivity of their test tapes to the ANSI preferred number series. There is much consternation and argument about the relationship between 185 and 200 nW/m². It's said that this differential is due to the differences of "open" and "closed" magnetic measurements. But, accord-

ing to Magnetic Reference Laboratories' J. McKnight, who is the person responsible for the introduction of this level, the move to 200 nW/m² was only for the purpose of number reconciliation. These tapes employ fringing compensation and use 1 kHz as the reference frequency.

250 nW: This was the first "+3" or "elevated level" reference fluxivity. The reference frequency was 1 kHz and was first introduced by Standard Tape Laboratories. This number was +2.85 above 180 nW/m² which is the fluxivity of a 1 kHz tone from a 185 nW/m² tape referenced to 700 Hz at 7½ or 15 ips. This is rounded to +3 for convenience. MRL also introduced a 250 nW/m² test tape, because this number finally conforms to the ANSI standard number sequence. The level differential between the STL and MRL tapes is due to the fringing compensation incorporated in the MRL tapes. This has become the DIN standard for cassette operation, using 333 Hz as a center frequency. The Japanese have adopted this standard for cassette production, with the reference frequency conforming to the ANSI preferred number of 315 Hz.

320 nW: This is the DIN standard level for 19 to 76 cm/s (7½ to 30 ips). First established as "peak recording level" way back when, this level was to correspond to "0" on a peak program meter. This is, curiously enough, +6dB over the approximate level of the original NAB standard. These days, this level often is referenced to "0" VU or -6dB on a peak reading meter. This

level is referenced to 1 kHz.

"+6": Ambiguous as it may seem, this number actually makes more sense than trying to refer to the other numbers above. The preceding begs the question "+6 relative to what?" and that is what makes this reference sensible. The use of "+6" requires contemplation of the reference level in use, and choosing either to go to twice that fluxivity, or to match an arbitrary level that is recorded on the tape. What this reference generally means in the U.S. is to align the reproducing circuitry of the tape machine to read -3 VU at the reference frequency of 1 kHz when reproducing a 250 nW/m² test tape conforming to the equalization standard in effect for the chosen operating speed. This number corresponds to an actual flux level of 353.13 nW/m², or +5.85 dB above the original Ampex operating level of 185 nW/m².

510 nW/m²: This 510 nW/m² is a somewhat newer reference, used to align DIN or CCIR reproducers to "0" on a peak reading meter. This level corresponds to +9 dB above 180 nW/m², which you will recall is the effective flux of a 1 kHz tone referenced to a 700 Hz 185 level. This effectively represents a +3 dB increase over the original Ampex level, or roughly corresponds to our "+3" level of 250 nW/m².

"Dolby Level": Not to confuse things any more than they are already, Dolby Labs attempted to influence operating levels on machines that employed their noise reduction system. The reasoning went something like: If we tell 'em to use 185 nW/m², then they won't be limiting the signal with the tape itself, and our compandor system will work within its proper dynamic law; and with the improvements offered by our noise reduction system, the reduction of operating level will not be negatively intrusive. Well, as it works out, what in fact happens is that "Dolby Level" refers not to the fluxivity, but rather to the operating level of the facility. When the tape recorder reads "0," then the Dolby is aligned to read in the center of the Dolby dot. They had the right idea, but studio personnel are forever going to do it their own way anyway!

What falls out of the above discussion is the determination that operating level must be tied to the volume units in use, and the alignment method must be specified if true tape interchangeability is to be fully realized.

Thus, a master reel with tones should include a note indicating what meter type should be used, such as VU or peak reading, and what the reference level should be set to.

OK, so now you understand where some of the confusion about operating level comes from, and why losses play such a prominent role in the recording/reproduction chain. So at this point you can see why we have equalization, applied both to the playback and record systems. Let's discuss some of the details...

Equalization

An important item of note: the current equalization standards are applied to *reproduction only*.

The equalization applied to the recording and reproduction system is designed to overcome the above mentioned losses, as well as to provide an improvement in the signal-to-noise ratio of the system. This task is broken into pre-equalization, applied during recording, and post-equalization, applied during reproduction. The division of the quantities of equalization used between recording and playback should not be an arbitrary one. The

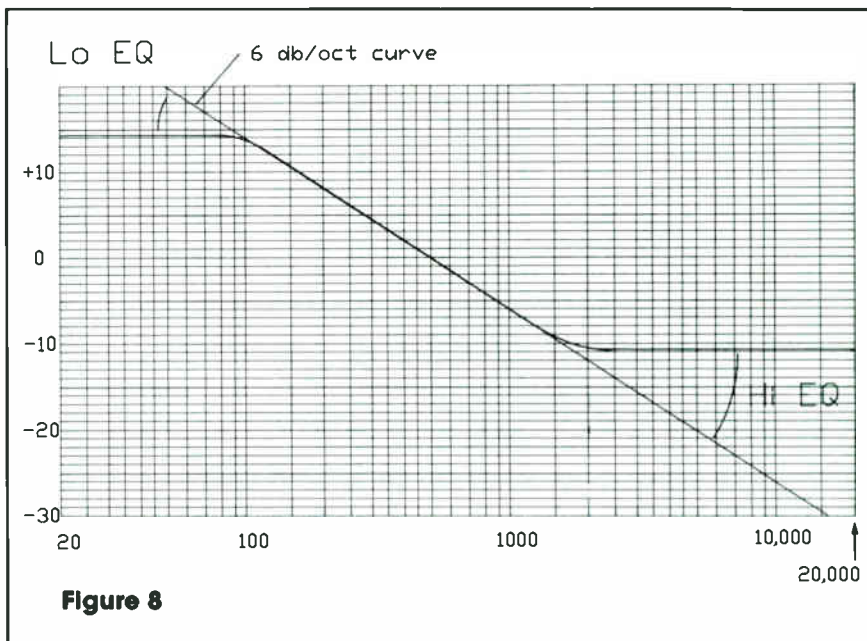


Figure 8

trade-off that occurs is between high frequency headroom and high frequency noise. Unfortunately, these two goals are mutually exclusive. The reproduce equalization is mandated by the various standards that are in place, and the equalization applied to the recording chain is that correction

required to create recordings that reproduce in conformance to the above mentioned standard. This means that the record EQ is tailored to the machine, tape and head characteristics of the recorder and tape used. (See sidebar).

Remember when we were talking

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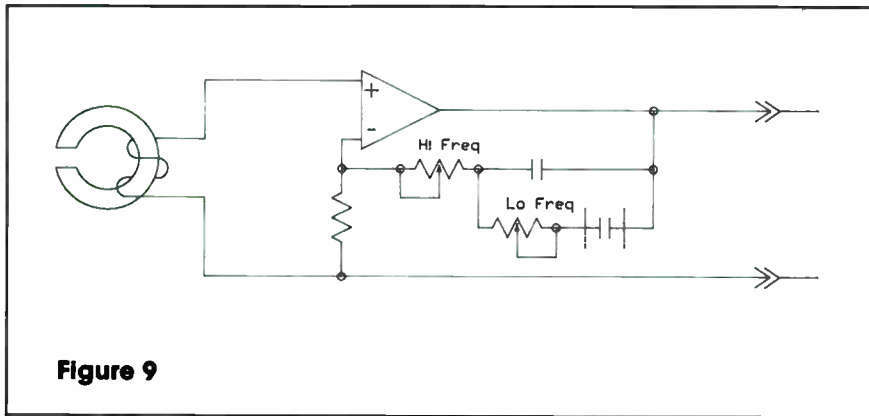


Figure 9

about the reproduce head having a response that rises at 6 dB/oct. with a constant flux? Well, to get a constant flux level, we need a constant current in the record head. Remember eddy currents, and the other losses of the record head that deprive the head of available flux? The rising response of the record equalization is intended mainly to overcome the rising impedance of the record head with frequency, to provide us with the ability to drive the record head with a constant current. Because some of the losses of the system are frequency-dependent, while others are wavelength (operating speed)-dependent, the EQ requirements change with the operating speed. The trade-offs between headroom and noise were made long before we had the need to adjust or repair our equipment, so I won't belabor the philosophies involved in the decision as to where boosts and cuts belong, but rather will try to illustrate where they are, and how to look at the system when we have response problems to address. Equalization standards are expressed most often as two different time constants, such as 3,180 and 50 μ sec. These numbers refer to the time constants of the combination of resistors and capacitors comprising the filters that accomplish the equalization (for example, $T=R \times C$). Therefore, for the NAB 15 ips standard, $T=50 \mu$ sec., and $C= .01 \mu$ F, $R=5 \text{ k}\Omega$. Since the -3dB point of 5 k Ω in series with .01 μ F is calculated with the formula:

$$F = \frac{1}{2\pi RC}$$

Therefore, $F= 3183 \text{ Hz}$.

The low frequency EQ point is calculated with the resistor and the capacitor in parallel. The following time constants provide the appropriate operating EQ standards:

Remember, the frequency response of the reproduce pre-amplifier starts at a falling 6 dB per octave, and the above time constants refer to break points on this curve. This means the low frequency EQ results in a flat response from the pre-amp, but this translates to low frequency attenuation. The high frequency response also is flattened out with EQ, but this translates to high frequency boost. We also have a boost requirement in record; so, we have high frequency boost in both record and reproduction. This overcomes all those losses we described earlier.

Much of what we're discussing deals with fixed EQ. We have adjustments in our machines, both for playback and record. The playback adjustment control has the affect of changing the "short" time constant, or high frequency turn-over point of the equalizer. Since most of the high end problems we encounter in a studio environment deal with spacing loss, if we crank up the high end EQ to make up for dirt on the heads, gap loss, or resonance losses, we end up bringing the mid-band up in level as well.

Remember that the turnover point of the standard for 15 ips is 3,180 Hz. The result of the turnover frequency being so low, coupled with the variable element changing the turnover point, means that turning up the equalizer for +3 dB at 16 kHz can end up bringing 4 kHz up about 1 1/2 as well! The net result of all this is that we must find out which one of the many losses is responsible for the problems we

face. For example, I have encountered machines that, when new heads were put on them, you could not turn down the top end. Upon inspection I found there was an EQ limiting resistor in series with the high frequency control. By lowering its value by half, we could bring the machine into alignment.

Most machines also incorporate some form of circuitry to overcome the effects of gap loss. The simplest form of compensation is head damping. You often will find that the head is terminated in a transformer, and the secondary of that transformer will have an "R" and a "C" in parallel across it. These elements provide "critical damping" of the head, and may be varied for optimal flat response in the 12 to 20 kHz area.

There are many benefits in optimizing this area of the circuitry, not the least of which is the phase response of the machine. When the reproducer is made flat, the transient response of the machine sounds better. Take care when doing this change, for the damping elements on the front end of the repro pre-amp correct for gap loss, which is a wavelength-dependent phenomenon, in a manner that is frequency-dependent. This results in the optimization being valid only for one operating speed. If this optimization is to be performed, do it at the highest operating speed where the losses are at a minimum. Otherwise, the extreme top end will take off, and "brittleness and hiss" will result.

If you think about it, you can see why the high end at 30 ips sounds so much better than 15 ips, because the wavelength-dependent losses are half as great, there is much less high frequency boost in the playback equalizer. But this gain is not without payment, and that occurs in the bottom end.

Low end problems at higher tape speeds are caused by a number of things, including head bumps, secondary gap effect and recorded wavelength versus pick-up size.

Head bumps and secondary gap effects affect us just as much at 15 ips as they do at 30, but at 15 the frequencies

Time Constant	Tape Speed	Standard	Tape Speed
Low Freq	High Freq		
3180	90 μ sec	NAB and IEC	3.75 ips
∞	70 μ sec	IEC and CCIR	7.5 ips
3180	50 μ sec	NAB	7.5 and 15 ips
∞	35 μ sec	IEC and CCIR	15 ips
∞	17.5 μ sec	AES	30 ips



Second in a Series

A Session with Murray Allen

What can you say about Murray Allen? Studio musician, master mixer, sound designer, digital disciple, raconteur, and a pivotal figure in the Chicago music and recording scene since the end of World War II. Long-time president of **Universal Recording Corporation**, he helped build the company into what he calls "the largest one-stop audio service in the country." Here are a few pithy observations from this voluble, outspoken, witty, and colorful walking encyclopedia of the recording industry.

On good sound

"Some people say, why have good sound? It's only a three inch speaker." Well, they're just lying to themselves because you can hear the difference on a two inch speaker. Just think how small a Walkman speaker is. You can hear the clarity or the distortion of the sound and everything else."

On working with ad agencies

"The front office is extremely important because there's so much service the client requires. It's a combination of engineering and the front office, not one or the other."

On digital recording

Digital was the start of the true recording business. Everything else was just fooling around. Analog not only reproduces the sound, but reproduces all the flaws of the storage medium as well--noise, dropouts, phase distortion... . In digital, when you reproduce the sound, you leave all the flaws of the storage device behind."

On the opponents of digital recording

"These are the people infected with 'Voodoo' ideas. They're people who are using a defense mechanism because they don't own a digital machine."

On choosing a supplier

"We want somebody who can deliver the product we want when we want it, and at competitive prices. We like suppliers who have a good relationship with their sources, so if we order equipment, we know we can get it. We have a good reputation and the people we deal with must have a good reputation too."

On AudioLine

"We want somebody who's professional and does their job as well as we do ours. I will say this about AudioLine. This is the most professional supplier I've ever worked with. They service me like I service my clients."

On working

"At one time, I used to mix sound during the day, play clarinet at a club until midnight, and then go back to Universal to edit tape. Life is too short to sleep."

On the future

"The future is very bright. Technology hasn't reached a plateau, it's just beginning."

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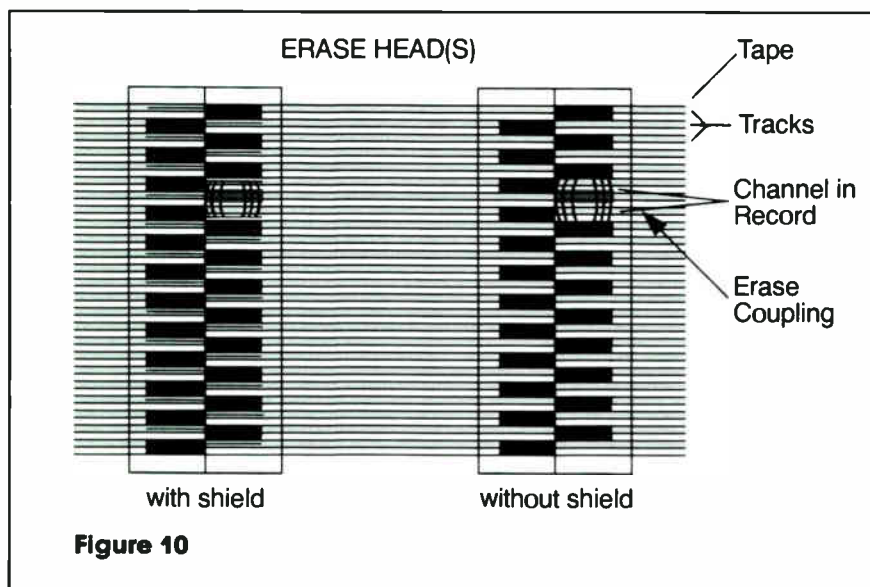


Figure 10

of disturbance are an octave lower than at 30, and usually fall below the lowest frequencies of interest. But at 30, these gremlins tend to jump out at the 50 to 125 Hz region, and the extremely long wavelengths at the frequencies below this make reproduction extremely difficult to achieve.

Consider this: we are able to extract the maximum signal from tape as long as the pickup transducer dimensions are greater than the wavelengths to be reproduced, and the gap is smaller than the shortest wavelengths of interest. When the wavelength of the reproduced signal is greater than the overall length of the pickup transducer, then we only are able to retrieve the maximum differential available at the transducer contact points. See Fig. 6. The signal we retrieve from a playback head is directly proportional to the rate of change of the magnetic field, as well as the strength of the field. Since a 30 Hz signal at 30 ips is over one inch in length, the wavelength is longer than the head dimension and therefore the response falls. Thirty Hertz at 15 ips has a wavelength of one-half inch. This usually is within the width of the "secondary gap" of the reproduce head, and the response is still robust.

Coupling the loss of wavelength resolution to the attenuation we provide to correct for head bumps and fringing, we see a rapid fall-off in the low frequency response of the reproducer. Methods for improving head bumps include increasing the width of the head, making the incoming and outgoing wrap angle of the tape non-symmetrical about the gap, decreasing the wrap angle of the tape-to-head

contact area, and ensuring that all of the angles of the head around the face of the head are radius'd curves and not sharp angles.

If the head penetration is not field-adjustable, there is not much the screwdriver-wielding maintenance person can do about these low-end problems, other than taking the heads to a service facility that can change the geometry of them. There are a few things that can be done electronically to improve the very low frequency response of a reproducer, and one of them was put forward by J. McKnight in a paper presented at the 1976 AES convention. MCI took him up on this one, and incorporated this change into their JH-114 and JH-24 series machines. (This change is responsible for the problems associated with the LF control affecting the wide band gain when it is at the end of its attenuation range.) See Fig. 9.

Bias and Related Arguments

Let's re-examine some knowns. The mechanism aiding the transfer of the current that's an analog of our audio signal to the strip of iron oxide we call "tape" familiarly is termed bias. This is a high-frequency, high-amplitude signal added to the audio signal. The benefits of employing bias are well-known and many. Some of them include: increased recording efficiency, reduced noise residual, reduced signal distortion and improved high frequency response.

The bias current causes a high-frequency magnetic field to exist about the vicinity of the recording head gap. To effectively function as an aid to re-

ording, the bias field must fully saturate the oxide as it passes over the record head gap. As the tape enters the flux zone, it alternately is saturated in both polarities by the bias field. The tape then proceeds to the "critical recording zone," which contains a field intensity below the tape saturation level corresponding to the linear magnetization characteristic of the oxide. Our audio signal is amplitude modulating the bias field in this region. When the dimensions of the wavelength of the modulating signal are significantly longer than the size of the recording zone, the magnetic undulations representative of the amplitude modulation of the bias field (our audio signal, in other words) remain on the tape as it leaves this zone. Signals that modulate the bias field whose wavelength is shorter than the length of the critical recording zone will not remain on the tape as it passes out of the recording zone, and will be of significantly lower level. This, in a nutshell, is how and why recording takes place on the trailing edge of the gap.

When we set the bias on a machine, it is common practice to set it while observing the playback monitor and recording a 10kHz signal at 15 ips. We then set the bias so that we "over-bias" the tape by 3 dB. Or, when operating at 30 ips, we over-bias the same amount with a 20 kHz signal, or 10 kHz over-bias 1½ dB. This method best establishes the size and shape of the critical recording zone, for if the bias level is established (say at the maximum 1kHz sensitivity level), minor reproduction level variations represent major variations in the shape and size of the recording zone. Any variations in the size of the recording zone represent a shift in time for the signal recorded. This results in an apparent phase shift of the recorded signal, and will result in high-frequency losses of the summed reproduction of the recorded signals.

The above mentioned phenomenon may be put to use in determining the accuracy of manufacture of the record head in a multi-track machine. If we set the record head azimuth using the summing method in sync playback, we have aligned the center-line of the gaps to be perpendicular to the recorded field on the test tape. When we then inspect the azimuth of the record signal on the same machine and find that the azimuth has shifted slightly,

—CONTINUED ON PAGE 200

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Our track

Before you leap into digital recording, look and listen first. You'll find that only Sony can take you every step of the way.

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k record.

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And if you need to merge digital audio with video, the PCM-3402 makes it easy. It gen-locks, chase-locks, performs time code based auto-cuing and auto-time fit, and time code triggered audio sampling.

Best of all the PCM-3402 and the PCM-3324 are digital links to an even bigger system. For that story, advance to the next page.

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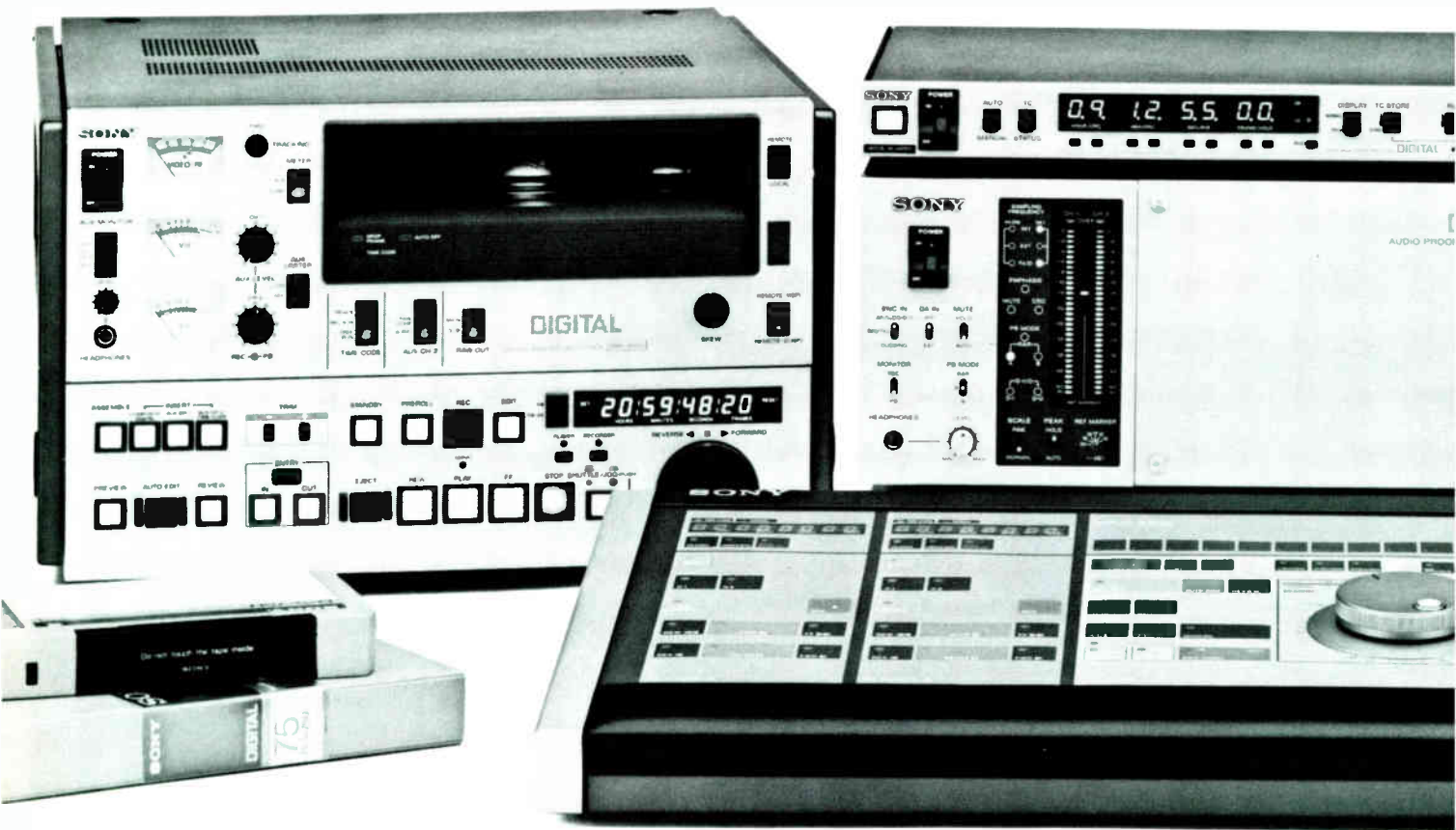


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mastered it.

Of course, no mastering system is complete without insurance. You get it with the DTA-2000 digital tape analyzer. When attached to the PCM-1630 and an optional printer, it measures and prints out any code errors in the master tape.

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Sony also makes digital recording tape, remote metering systems, and a full line of accessories. So if you're about to go digital, or want to get further into it, talk to the company that goes the whole route. Call the leader in Digital Audio at 800-635-SONY.

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MONKEE BUSINESS



by Hal Blaine with David Goggin

In this second installment from his forthcoming autobiography, session drummer extraordinaire Hal Blaine talks about working with The Monkees.

The date was June 10th, 1966; the place was RCA studios in Hollywood. Leon Russell was on piano, and I remember him smiling quietly to himself, wondering how they could have used a name like "The Monkees." It sounded like a showbiz hoax—The Monkees?

Jeff Barry was producing the sessions for Don Kirschner Productions. Jeff had been contracted to produce this "band" of four youngsters who would be America's wacky television answer to The Beatles. Screen Gems and Columbia Pictures were setting up the biggest promotional push in the history of the studio, and they kept these kids running from wardrobe sessions to TV interviews to screen tests to the

rehearsals for the TV series.

At the time, we had no idea of the impact these four kids would have on the world of entertainment. I guess we should have suspected something, though, since everything our studio band—the Wrecking Crew—recorded had been turning to gold. That's why we were here.

When we did meet the group, we were surprised—they were highly in-

telligent, and well manicured. They were typical products of the times: young, vibrant, long-haired, cute—and funny as hell. It was joke after joke, and these kids could handle themselves like the top comedians of the day.

I've often been asked how some of the different groups we worked with felt about a team of pros making their records. I don't think they minded at all—after all, while we were making 35 bucks for making their records, they were making \$35,000 for performing them on stage. It was just the nature of the business and we figured that most people understood, although for obvious reasons, our behind-the-scenes role was not publicized. In many cases, the stars were too busy touring to spend the weeks and weeks in the studio it usually takes to make a great record. They were on the road or making films and couldn't stop to make all the records that had to be released on schedule. That's why the

They were typical products of the time: young, vibrant, long-haired, cute and funny as hell.

Wrecking Crew was called in to make those records.

Towards the middle of 1967, our idyllic studio relationship was briefly jeopardized by what became known to some as "The Monkees Scandal." A fan magazine, obviously out for blood, did a slashing article on the group and "exposed" how The Monkees didn't make their own records. This revelation shook the foundations of The Monkees' media machine just when the band's weekly TV show was hot, their records were consistently at the top of the charts and their concert appearances were always sold out. They had achieved genuine superstardom, and now a magazine was trying to destroy it all. No question about it—there was trouble in paradise.

I remember one day in Studio A at RCA we were making Monkees records in a studio the size of an aircraft hangar, with all the doors locked and "closed session" signs hung all over. Next door, in Studio C, the Monkees sat at their instruments making music for the press. The studio bosses had set up the session to squelch the ugly rumors, and the boys gave a convinc-

ing performance.

Eventually, things cooled down, and later that year I got a call from band-member Michael Nesmith (he of the drawl and knit cap) asking me to contract some musicians for a few dates. (This was a common request—I had been contracting for all the guys in the group as they developed their solo careers and did the same for many musicians in Hollywood. Not only had I established myself as a session drummer, but also as a contractor whose deals were honest. I made sure no one got cheated when they worked for me—this in a business well known for cheats. There were unreported dates, unpaid dates, forgotten overtime, and doubling and overdubbing that was mysteriously forgotten. Fortunately, the Wrecking Crew was on top and could weed out the grafters. Our answer to the sleazy ones was "Sorry, we're booked this month." We even gave a list of cheaters to our answering service, and when someone on the list called, the answer was: "Sorry, they're out of town.") Anyway, Michael called me and laid out the plans for a super ses-

sion the likes of which had never been seen in Hollywood—a session that would be done on Saturday and Sunday, known as "golden time" for union members. It was a date that we'd never forget—catered with Chasen's silver service and a gathering of musicians that was almost unbelievable. Shorty Rogers was doing the arrangements, and what a call it was: ten trumpets, ten trombones, ten saxophones, five percussionists, two drummers, four piano players, seven guitars, four Fender bass players, four upright basses, and on and on. It sounded like World War III. In fact Nesmith was going to call it that, but changed it to "The Pacific Ocean" and ultimately called it "The Wichita Train Whistle."

The town was buzzing with excitement about the session; no one could believe that it could get on tape. I was the envy of all the major contractors in town; in fact many of them called me and made nice offers to take over the job. *Everyone* wanted to be on the session.

The dates arrived: November 18 and 19, 1967. Shorty had worked his



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ass off and came up with brilliant arrangements. Earl Palmer and I were on cloud nine because it was a drummer's dream to be able to kick this gigantic band in the butt. We all took a lot of breaks during the recording to stuff our faces with gourmet chow. Gene Cipriano, the saxophone/oboist, got his reeds jammed with caviar. We were all like kids in a candy store. Two of the Wrecking Crew trumpet players were near to exploding. It was the freebee of freebees.

Finally I asked Michael why he had called for such a costly session. He explained that Uncle Sam was about to remove 50 grand from his pocket and, instead of paying the taxes, he decided to spend it on a raucous write-off. So Nesmith made his peace with the IRS, our union pension plans got a healthy shot in the arm, and everyone was very happy.

(The Musician's Union pension plan calls for every member to get an extra 10% above his gross salary for a job. The pension money is paid by the employer to the union fund and goes directly into an account with the musician's name on it. After 30 years or so, it can really add up and help out in your old age. That's why it's so important for union members to be sure there is a contract on every job and that the pension gets paid. Whether it's records, TV, movies, commercials, or even nightclubs and casuals there must be pension money. Many of the members don't even know about the pension requirements, but it's very important to check it out. We're all terminal in this business. When it's over, it's over. Unless you want to spend the rest of your life working honky tonks for low pay, see that your pension is taken care of.)

The Nesmith dates came off without a hitch. It was the greatest party we had ever been invited to. Two days of Chasen's food, and more music than you could expect to play in a lifetime. It was fun and games all the way through and when the last note was played, Tommy Tedesco threw his guitar up in the air (about 40 feet), and we all stood there frozen as it crashed down on the floor of the studio and splintered to bits. He had the pieces mounted and framed, and it hangs over his favorite poker chair to this day, bringing back all the wild memories of our times with The Monkees. ■

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Besides an excellent recording system, AMR manufactures the **PRM™ Series** studio quality phase reference monitors. These highly efficient monitors feature 18 dB per octave crossovers with time correction. Foam acoustic blankets reduce baffle reflections, thereby minimizing comb-filtering colorations. Each monitor exhibits accurate frequency response for true fidelity playback with excellent imaging.



The AMR attention to product quality, flexibility and studio-smart functionality carries through as the design criteria for microphones as well. The **ERO™ 10** and **ERC™ 12** condenser microphones exhibit a crystalline transparency like no other mic you've tried before. The **DM™** series dynamic microphones offer hyper-cardioid and specially-tapered cardioid patterns as well as internal hum cancellation coils for low-noise, quality performance. Similarly, the **PMA™ 200**, 100 watt per channel power amplifier produces clean, reliable power with a high slew-rate and .008% THD distortion specs to meet the demands of today's studios.



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LAURIE ANDERSON

THE QUEEN OF ARTS

Catching Laurie Anderson is like fishing for a porpoise. You can't use a fancy lure, hoping to simulate reality with artificial bait—and a hook would be a horrible thought. Let's think of concepts and images that would intrigue a playful spirit of the deep.

Our first meeting was by chance, at a street fair in Hollywood. She was watching a young woman who had attracted an audience by beating out music on a plastic water jug. In the

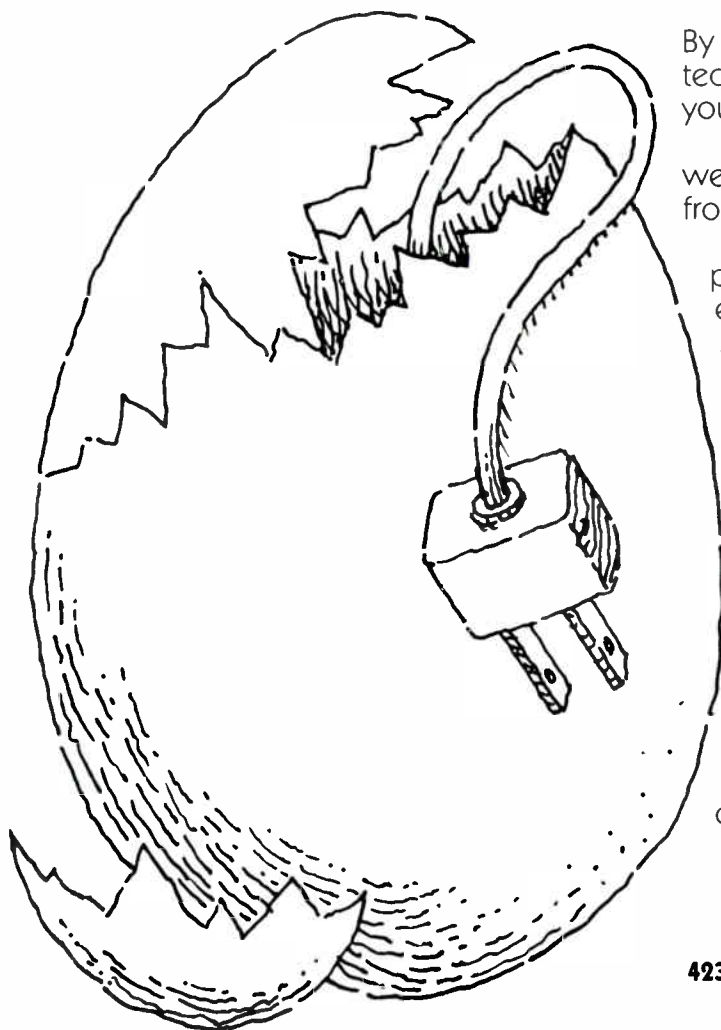
midst of the percussive festivity, I introduced myself and suggested that we do an interview. She smiled and said, "Maybe."

Laurie Anderson grew up in a small town in Illinois and began playing the violin at the age of 5. She studied art in college and as an artist in the early '70s, worked in sculpture, photography and video. As a performance artist, she mixed poetry, stories and songs and gained widespread recog-



Laurie Anderson casts a musical spell in this clip from her film, *Home of the Brave*

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“I’m not the kind of artist who works well in complete isolation. I need to know what people are thinking about and what they are talking about.”

—LUNCHING WITH BONZAI

nition in America and Europe. In 1980, she recorded “O Superman,” which rose to Number 2 on the British pop charts. Her artful music videos are seen both on television and in art museums. Laurie’s recordings have utilized the talents of such musicians as Peter Gabriel, Andrian Belew and Bill Lasswell. Her inventive concert film, *Home of the Brave*, is rich in imagination and new technology.

This fall in America, Laurie was asked to introduce a series of experimental films and videos seen on PBS. Through electronic devices, she appears simultaneously as herself, and also disguised as a little man. Together, Laurie and her “clone” provide humorous insights into the avant-garde.

A few months after our first meeting, we spoke on the phone and she suggested that Mrs. Bonzai (Keiko is a sculptor) and I meet her at the Hollywood Diner. I expected a hamburger joint, but instead we found ourselves in a glassy French restaurant sprinkled with greenery. We ordered some charcuterie and awaited Laurie’s arrival.

She entered the restaurant gracefully, sat down at our table and I immediately began talking about porpoises. The subject interested her because she quite often uses animal sounds in her concerts, and has experimented with unusual audio systems. Recent scientific studies suggest that porpoises can create extraordinary “stunning sounds” which disorient and paralyze their prey before dinner.

Bonzai: Can you imagine performing in a time when there was no electricity?

Anderson: It would be more practical in some ways, because I use a lot of natural sounds—birds and wolves and things that tour managers hate. Bring ‘em out on the stage and pound on their cages.

Bonzai: You’ve never used live animals?

Anderson: No. But it could be interesting in a predictable kind of way. I’ve been training a dog and that’s been very enlightening. I’ve never liked dogs at all and recently got one. I use animal sounds a lot, but never really worked with animals. It’s almost frightening when you realize you can speak to them, and that they do actually understand you. It’s breathtaking. You have to pound it into them a little bit, but they get it. I have a very smart dog—a terrier.

Bonzai: I’ve heard that it’s best to start out with food as a reward. They seem to understand that as an urging mechanism.

Anderson: I think that artists understand that, too. It’s half the reason they get themselves going.

Bonzai: Dogs can be devoted to a fault, giving up their nature.

Anderson: They can be stubborn. I think it’s sad to see a really wild, untrained dog that is so scattered that it doesn’t know what anybody wants or what it’s supposed to do, because it’s locked up and half-trained.

Anyway—music without plugs. I became conscious of that last year while on tour in Sardinia, with a lot of equipment. They just got electricity there about five years ago, so their response to this was kind of, “Huh?”

And looking out at those people—their eyes are completely jet black. Southern Italians. It was incredible to see this sea of totally dark eyes. There was one little girl in the front row with her mother. A girl with dark eyes and the mother looked exactly like her, only older. I concentrated on trying to do something that they would get, somehow. Not that I changed the show a lot. They had a very good time—I don’t know why. I think it was

like a strange freak show, or a circus, to them. Just some other amazing thing that came through town.

Bonzai: Who booked this date? Did you choose Sardinia?

Anderson: [Laughs] It was through the Italian government, who sponsored part of the tour. They had decided it would be good to do some things in the provinces. I was real happy to do that, because they don’t depend on miracles the way they do in big Italian cities.

Bonzai: What’s the difference between animals and human beings?

Anderson: It depends on the animal and it depends on the human being. Generally, I think animals are more empathetic, naturally. That’s what is most striking to me about dogs. You can do a pretty good job of hiding certain things from other people, but not a very good one with animals, who can really sense what’s going on.

Bonzai: Let’s talk about men. You seem to have fun with your alter ego, the little guy. If you could be any man for a day, who would it be?

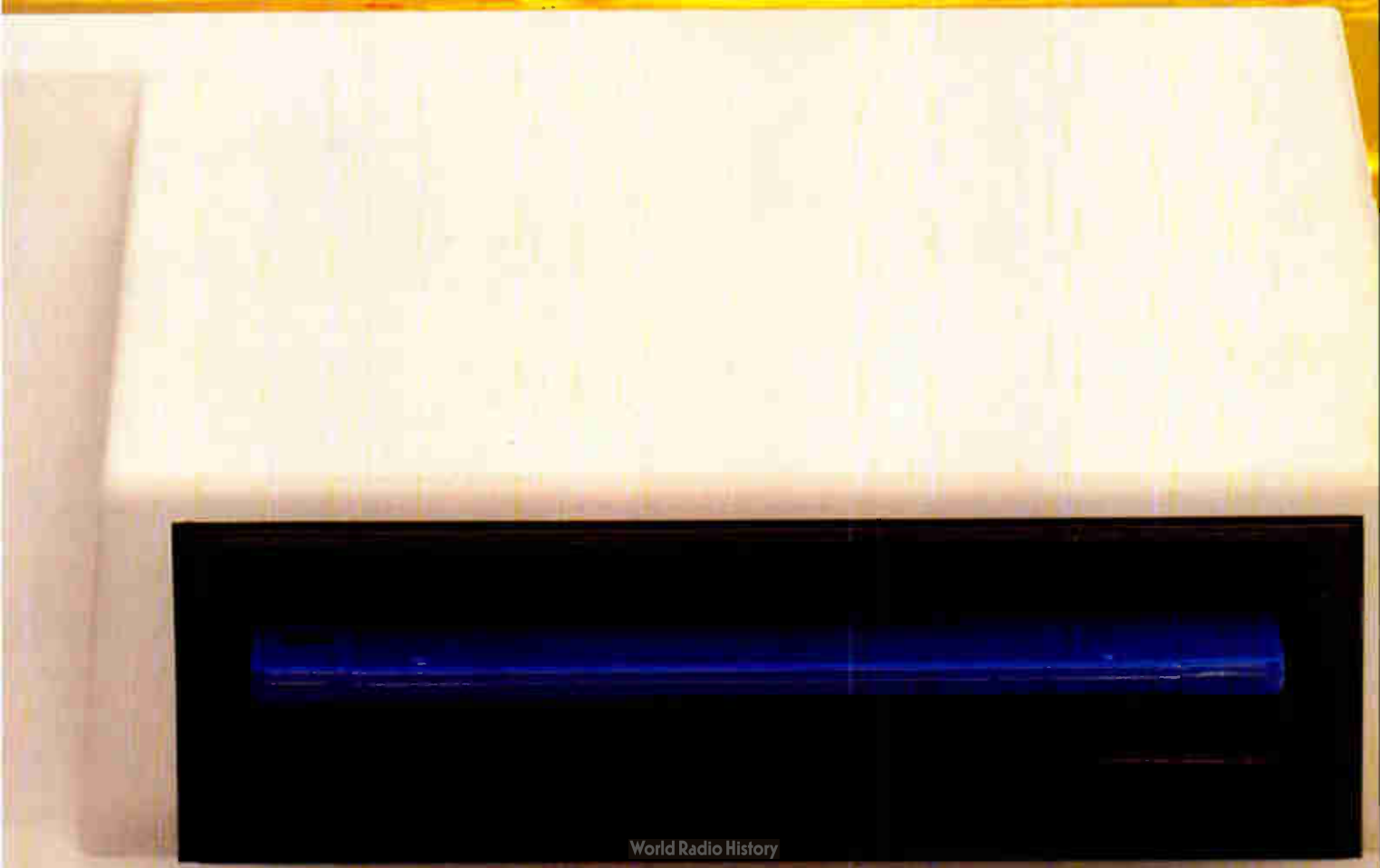
Anderson: Hmm... it almost wouldn’t matter. The change would be so enormous. In a certain way, I base my most vivid pictures of who men are on my earliest impression. Now, I’m not sure in the most important ways there are big differences. In cultural ways, there are enormous differences, and getting bigger.

The character that I based this clone on—and I only discovered this in working with this guy recently—was my father. He would come into my room when I was sick, or sad, and do these little dances and tell jokes and tell me stories. And I thought, how charming. Men are just so lovely.

The women were the authority fig-

—CONTINUED ON PAGE 61

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MicroComposer. The advent of MIDI has made incredible progress possible for all kinds of musicians—giving them power they never had

before. But in order to harness that power, musicians need the proper tools. The MC-500 was created to fill that need—to harness the power of MIDI and give all musicians the power to control and use MIDI to their best advantage. In recent years, there have been various alternatives to controlling MIDI music systems. Some people have used personal computers equipped with MIDI software and interfaces. Some have turned to dedicated sequencers. Each has had its disadvantages. For all the power they offer, PC's are built for the businessman's environment, not the musician's, and as such they don't take well to life on the road. Also, they can be quite slow in performing MIDI functions, and as we all know, interfacing a computer to a MIDI system is often clumsy at best. Dedicated music sequencers are built for the musician's environment, but usually lack the features and flexibility of personal computers. Simply put, they can't be upgraded with new software, which means they can become obsolete before you've finished paying for them.

The MC-500: A Computer with MIDI Jacks/To solve this dilemma, Roland's engineers have created an engineering masterpiece—a powerful personal computer, with more memory capacity than the average PC, that is designed inside and out (from the front panel controls to the back panel jacks) for the MIDI musician. Like a computer, the MC-500 MicroComposer has no functions of its own—its functions are loaded off a software disk via its disk drive. In this way, depending on the software you load into it, the MC-500 MicroComposer can become almost any type of MIDI control device you require: a sequencer, a sound librarian, a live performance system controller, and a MIDI interface system—all in one compact, roadworthy unit.

In the Creative Process/The benefits of this type of engineering become apparent almost immediately, as the MC-500 MicroComposer allows you to create and control music with seemingly effortless keystroke commands. In many ways it's more like working with tape recording than computer sequencing, because the

MC-500 MicroComposer is laid out in much the same logical manner as an advanced digital tape recording system. The beautiful ergonomics of the MC-500 MicroComposer make it apparent that you are working with an instrument that was designed for musicians,

from such easily-understood controls as Record/Load, Pause, Play, Stop, to the Alpha dial which speeds you through tasks which might otherwise slow down your creativity, to the speedy 3.5" disk drive, to the back panel—full of MIDI and tape interfaces, as well as footswitch

jacks for those tasks too important to tie up your hands. **MRC-500 Software/**The MRC-500 Software Disk is the first in a series of software products for the MC-500

MC-500 BACK PANEL



500 MICROCOMPOSER

ULTIMATE IN MUSICAL PERFORMANCE

MicroComposer. It offers the ability to perform highly advanced MIDI sequencing, editing, disk storage of programs, as well as system exclusive control over patching and assigning your MIDI instruments. Simply load the MRC-500 Software Disk into the MC-500 and you're ready to create music exactly as you've imagined it. The MC-500 can hold performance data for roughly 25,000 notes — up to eight songs — in its internal memory, with additional storage of up to 100,000 notes on the Disk. The MRC-500 allows musical data to be entered from either your MIDI instruments, the ten-key keypad or the alpha-dial, which are then played back through your MIDI set-up. Songs can be named, and linked together, while the 40-character LCD prompts your next command. The accuracy with which the

MC-500 records your performance nuance is simply breathtaking. No glitches, no weird or unnatural error-correction, just simply what you've played. The faithful re-creation of your performance is truly one of the hallmarks of this amazing tool. In fact, so good is the quality of the recording, that you'll probably notice aspects of your technique that you never noticed before.

Recording Tracks/At first glance, you will see that the MC-500 MicroComposer has four polyphonic recording tracks plus a rhythm track. But, as is the case with most of the MC-500, there is a lot more

SOFTWARE DISK



here than meets the eye. A special Merge function allows you to combine the information on one track with the information on another (similar to "bouncing" tracks on a multitrack recorder). Using this function you can record up to 256 musical parts (16 MIDI channels times 16 voices) and MIDI channel information is retained for each merged track. Later, if you desire, you can un-merge tracks using another function called Extract. The MC-500 allows you to merge and un-merge as many times as you like, and because it is all digital information, none of your performance is ever lost.

The Rhythm Track/The rhythm track gives you the programming power of the most advanced rhythm machines, by creating individual rhythm patterns and then organizing them onto a track. In this way you can control sound sources such as Roland Rhythm Composers, Digital Samplers and Drum Modules, as well as most other MIDI-equipped drum machines. Up to ninety different Rhythm patterns can be created in step time, and then combined at will by using the MC-500's Copy, Insert and Delete functions. And, for the first time, you can not only create, but store your rhythm tracks along with the rest of your performance data — all on the convenient disk drive. No more separate loading of rhythm and program data.

Tempo Control/The MC-500 MicroComposer allows you to modify freely the tempo of any recorded performance. Using the alpha dial it is easy to change in real time, the tempo of the entire piece (which is displayed in beats per minute). But the MC-500 MicroComposer also contains a separate Tempo Track, which is capable of altering the tempo over the course of the piece. In this way, it is possible to create continuous tempo changes such as *accelerando* (a gradual increase in speed) *ritardando* (a gradual decrease) or even immediate abrupt tempo changes.



Recording a Performance/The MRC-500 Software allows a performance to be recorded in Real time or in Step time. Overdubs on additional tracks can be made within a few keystrokes of recording the original track, so you can never lose the feel for the music due to complex record set-up. If you make a mistake, the Punch In/Out feature can fix it with minimal fuss (just like on tape) but faster and more reliably than on any tape machine. For sequenced parts or others that are hard to play in Real time, the MC-500 allows Step programming — and since Roland invented this method of programming, you can be sure that it is done here in a manner that is both easy and precise.

Precision Editing/The distinction between a good and a great

program comes in the attention to detail, and it is in the editing process where the MC-500's detail shines clearly through. Any performance, whether recorded in Real or Step time can be fully edited down to the most precise detail. (Figure 1) An exclusive feature built into the MC-500's controls is the Microscope function. By entering the Microscope, you can then manually walk through your performance (event by event, forward or backward) simply by turning the alpha-dial. Microscope can be used to isolate any unwanted notes or MIDI events, and then they can be easily deleted, corrected or re-written.

Advanced MIDI Implementation/In its MIDI implementation, the MC-500 is perhaps the most advanced MIDI control device ever made. It can receive or send MIDI messages on any or all of the 16 channels, and can receive or filter polyphonic aftertouch, pitch bend, channel aftertouch and system exclusive (even for instruments not made by Roland). (Figure 2) The MC-500's system exclusive features alone could save you hundreds of dollars in the cost of memory cartridges.

In the Studio/On the Road/The MC-500 is designed to be at the heart of any MIDI system, and as such it is

equally at home in the studio as well as on the road. Because of its flexibility, edits can be made to stored programs with breathtaking ease. Does the producer want you to change your song to drop one verse and add another chorus? It only takes a second. For film work there has never been anything in this class before. By synchronizing the MC-500 to Roland's SBX-80 Sync Box, SMPTE sync is perfect. Plus, the ability of the MC-500 to allow

parameter editing in real time means that you can change parameters while you are watching your performance. On the road, the MC-500 can handle as many keyboards as you can throw at it. Need to change programs and parameters on all your instruments eight times for eight different

songs? With the MC-500's Chain play ability, you can string eight different songs together for access in three keystrokes. And with the speed of the MC-500's disk access, you won't ever wait long for new material.

The Result: Total MIDI Control/If you need to control a MIDI system, there is no better choice than the MC-500 MicroComposer. For not only will it fill your needs today, but it will fill your needs in the future through software updates and new uses. Plus, at only \$1395.00* the MC-500 must also rank as one of the

world's greatest computer bargains, especially when compared to the cost of a

personal computer, software and interfaces. If you think it's time you mastered MIDI, rather than the other way around, the best way to do that is with the incredibly versatile, amazingly affordable MC-500 MicroComposer. The MIDI Computer. RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685 5141.

FIGURE 1 EDIT FUNCTION CHART

Performance Editing	Track Editing	Merge		Disk Editing	Rename	
		Extract				Delete
		MIDI Channel Reassignment				
	Measure Editing	Transpose		MIDI Message Editing	Micro-Scope Functions	
		Change Velocity				
		Quantize				
		Erase				
		Delete				
		Insert				
		Copy				
	Note Editing	Micro-Scope Function	Note Name		Note	
			Note Strength			
			Note Length (Gate Time)			
			Delete			
			Insert			
			Timing (CPT)			
	Polyphonic After-Touch					
	Control Change					
Program Change						
Channel After-Touch						
Pitch Bender						
Exclusive						
Tune Request						

FIGURE 2 MIDI MESSAGE TRANSMISSION CHART

Setting of Output Assign	Both MIDI Out connectors transmit MIDI messages on all MIDI channels			MIDI channels can be assigned individually for each MIDI Out connector			MIDI Out 1 connector transmits MIDI messages on all MIDI channels and MIDI Out 2 connector transmits only MIDI clock message		
Functions	Timing Clock	Exclusive	Soft-Thru	Timing Clock	Exclusive	Soft-Thru	Timing Clock	Exclusive	Soft-Thru
MIDI Out 1 Connector	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off
MIDI Out 2 Connector	On/Off	On/Off	On/Off	Off	Off	On/Off	On	Off	Off

LUNCHING · WITH · BONZAI

—FROM PAGE 56, LAURIE ANDERSON

ures. The teachers, mothers. Eat this food, read this book. And the men just didn't seem to have a care in the world. Lighthearted. Later on, other things happen, but it never totally cancelled this playfulness. Ultimately this is, I suppose, a very snobbish way of looking at it, too. It's men's view of women, too: playful, lovely, and not a care in the world. "What are you *talk-ing* about? Give me a chance to be a human being, please." It wouldn't be based on any hero worship—being any man would do.

Bonzai: Did you have a happy childhood?

Anderson: Yes, I did.

Bonzai: Do you have any very early musical memories?

Anderson: Yes, it was one of the reasons I always used to mix up Japan and England. I used to get them very confused. It was Chubby Checker's fault.

I have seven brothers and sisters and we had a big playroom with a floor-to-ceiling map of the world. The United States, of course—dead center. Russia chopped up in two halves and shoved over to the sides. I would roller skate around the world to Chubby Checker records, while this map zoomed by. It was kind of a crude map and there were two little islands at the top. Both looked like boots—Japan and England. They looked similar and they seemed so special because they were so isolated. We asked who lived on these islands and were told that people on these islands love tea, and they have big gardens, and big navies, and they are very proud and reserved. Ever since then, I got the two places confused.

Bonzai: My grandparents came from Ireland; Keiko's family is in Japan—we muse on whether there is an island mentality.

Anderson: Absolutely there is. Sure it's true. Isolation—there is something much more reserved about anyone who lives on an island. Nobody drops in by chance. It's a big deal to visit.

Bonzai: What's the most frightening movie you've ever seen?

Anderson: *Nightmare on Elm Street*



—Part 3. It's real scary. Freddy's fingers turn into hypodermic needles at the flick of a switch and he comes after you with ten hypo's. They're not fingernails or knives anymore. It combines violence and medicine and street drugs in a way that's completely believable.

Bonzai: Did you read the story about the *Live From Off Center* TV series where you were described as a "new wave Alfred Hitchcock?"

Anderson: I didn't see that. I looked at a lot of things when I decided to do that project. A lot of Alfred Hitchcock and Rod Serling and anyone who introduced things. The more oblique Hitchcock is, the more locked in he gets to the picture, the better the introduction is. That certainly was my

approach to the shows, because I think the best of them stand on their own, and are not served by someone going, "So-and-so did blah-blah-blah and this is how it fits in and this is why you should think it's important."

Bonzai: Especially with these avant-garde pieces.

Anderson: Yeah. And there are a couple of really lovely things in the series. What I tried to do was pick one or two aspects of what they were doing, and work with that.

Bonzai: This brings to mind something—you mentioned your tour for the Italian government, and the TV series is funded. Interesting that a counterculture artist would be associated with government programs.

LUNCHING · WITH · BONZAI

Anderson: I always have been, since starting out. I would bet that at least 50% of the artists working full time and supporting themselves that way have gotten government grants—national endowment or state council grants. It's a very small percentage of the national budget, far outweighed by military marching bands. But still, it has helped a lot of artists. I'm not apologetic about it. If they don't place certain restrictions on it, it's all the better.

Bonzai: Would you say we have a fairly healthy country for an artist to live in?

Anderson: I'm not sure I'd go that far. In fact, subsidized programs can produce pretty mediocre work. If you are an artist and all you have to do is hand in a print every month that will be hung in a bank—half of those people are off in New York having fun, and they send in a print that they did last year. It's really too much like a job. There's something to be said for the romantic struggle.

Bonzai: Where is the most exciting work being done?

Anderson: There are all different places. I used to think that New York painters had made a big surge forward, but not from what I've seen in the last year. It's more professional, but it's real high finance. That's one of the reasons I wanted to get out of the art world in the first place. I really couldn't stand this mixture of parties and money and chit-chat and gossip, and what's hot now and what isn't. It was so boring and had nothing to do

with art. I think that artists had a lot of trouble with that, and with the economics of it in particular. They end up selling their work to a collector and that work ends up sitting in this person's dining room. After a while, the artist has to sit down and go, "Who am I talking to? Who am I making this for? Just for this guy's stock portfolio?" It goes directly from the exhibition into the dining room.

That's what I love about records—they're so cheap. You can do your best work on them and sell it for very little money. It makes a lot of sense for me. It's completely impractical for a lot of artists. If I were a painter, I'd just listen to this and go, "Ichh, what am I supposed to do—Xerox my work and hand it out?" Surface problem. The real problem is trying to define why you are making something.

Bonzai: Do you have any advice for artists?

Anderson: It depends on what you're working for. For me, it's an art of communication. I do think that the best work of art in the world could be made by an artist sitting alone in a room and nobody else in the world knows. And it can be the best. Anyway you look at it—if you thought the more people liked the work of art, the better the work, then Frank Sinatra is the best musician in the world, and Andrew Wyeth is the best painter.

Bonzai: I guess there must have been great artists in the past, that no one ever knew of.

Anderson: It's less possible now than it was, because everybody knows everyone else's business. It's harder now to go off to Arles and paint [like Van

Gogh]—it just is. Someone will poke around. It's unfortunate, especially for young painters who are just starting out, if they get a media attack. They're 18 and suddenly become art stars—it really can be confusing. It can also be really good. It depends on a lot of other things. Painting, it seems to me, grows a little more slowly than something like music.

Bonzai: Has the music business been good to you?

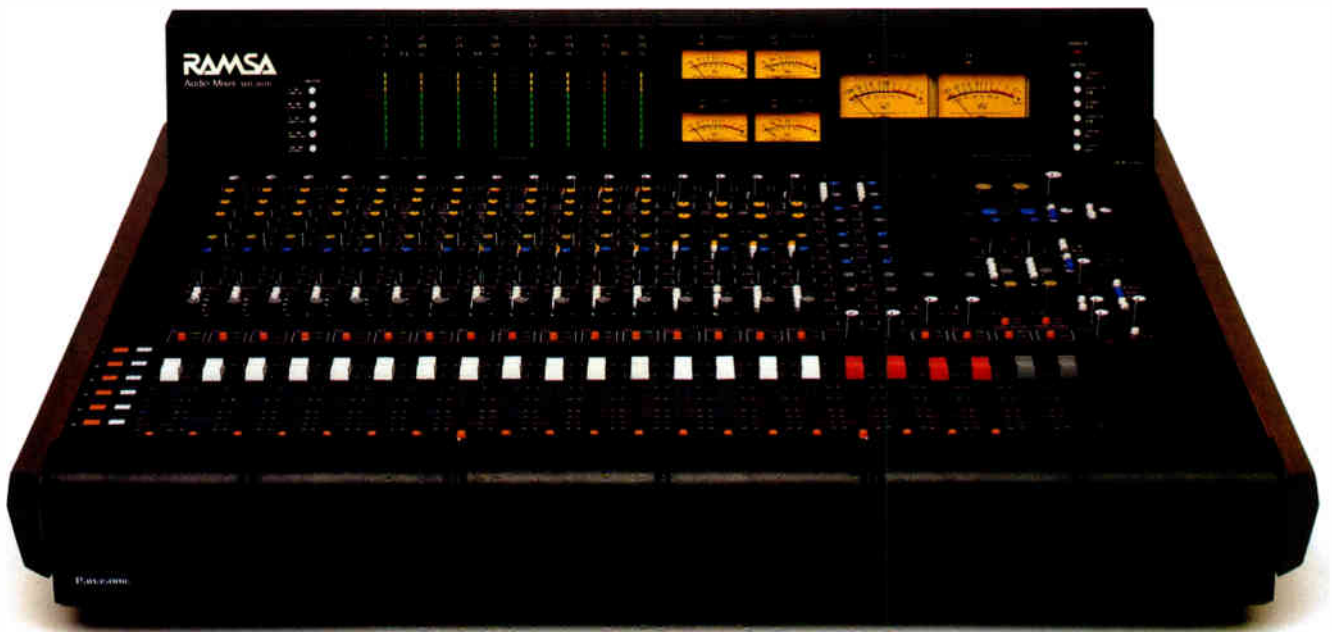
Anderson: Yes, it has. It makes very clear economic sense to me. There is only one rule: If you sell records, you can make more records. If you don't sell records, you don't make any more records. It makes breathtaking sense. If nobody wanted to listen, you would stay at home and entertain yourself with the music. You wouldn't bother to go to the mastering session and get it just right for mass distribution. It's clear, very well-defined.

Bonzai: What are your musical tools these days?

Anderson: Right now they are similar to a lot of people's: a Macintosh, and a lot of digital samplers. I've used a Synclavier for a while, and harmonizers. In my concerts it's like bringing a recording studio onto the stage. The reason that most people don't do that is because it's delicate equipment and it usually breaks down. But I like it when it breaks down. It's one of my favorite parts of the concerts, because you have to figure out something to do.

Bonzai: I used to feel uncomfortable when someone forgot a line in a play—it's happened to me—but it really is an interesting moment in theater.

“There is only one rule in the music business: if you sell records, you can make more records. If you don't sell records, you don't make any more records. It makes breathtaking sense.”



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Anderson: A wonderful moment. To me, it's the only time when you appreciate the fiction that is being spun for you. That line is very important in the work that I do. To break down the ideas of what all those people are doing there. What they might expect. I do that, I suppose, because I don't really trust those formulas. I want to make a different kind of contact with people.

Bonzai: To prevent your own boredom?

Anderson: It's not only my boredom. Hopefully, it's other people's boredom as well. I have to trust my own instincts to make that jump. If it bores me, then it's going to bore other people. Sometimes it's not necessarily true, but I have the advantage in the kind of work that I do, of seeing people's faces. That's rare for artists, unless they hide in the gallery and look through a peephole to see who is spending time and who is just scanning.

Keiko: Good energy for construction.

Anderson: Mmmm, it is. It clarifies a lot of things. I'm convinced of this: the ideas and images that are the most immediately perceptible, right then, are the ones that are the most powerful. Yes, there are things about some works of art that you can realize later, but I think that the strongest ones go right for your heart, that second. You look at it and it's something so completely realized that you'll never forget it. Works that you have to read books about to appreciate can have a different sense, and eventually a strong one. But I really think that the simplicity of an image, or of a sound, is something that is, first of all, hard to make—it means that the artist has to throw a lot away, and just use the most important and the strongest things. Nothing else to decorate it.

Bonzai: You seem to have a very diverse audience.

Anderson: Motley.

Bonzai: It must be nice to have support from the art, music, and the film worlds.

Anderson: It is. But I recently stopped working for a few months—just forced myself to stop. I realized that I hadn't stopped for more than an

afternoon since 1971.

Bonzai: Is this a time of big change in your life?

Anderson: Yes, it is.

Bonzai: Are you considering leaving New York?

Anderson: I'm spending more time here [L.A.] lately—looking around to see what's going on.

Bonzai: Anything interesting?

Anderson: Yes, I think so, but it's from the few people that I've met, that I enjoy talking to. It's more than a "scene" that I depend on; it's just some people to talk with. But the scene comes out of that anyway. When there are people talking, there's a scene. That's just how it works, because they'll make one. I would never have considered spending much time away from New York before, except in Europe, but in the last couple of years I've found that I'm no longer convinced that New York is the capital of the entire universe. In fact, I'm not very interested in a lot of the work being produced there. I think it will still be good for theater, but it's not necessarily true that the best painting, the best sculpture, comes out of there at all.

Keiko: Good for business, but not good for creation.

Anderson: I don't agree with that, but I've lived there for 20 years. I depend on these small neighborhoods and scenes that are there. There are always people—you can walk out your door and in five minutes see something wonderful, or talk to someone who is interesting. I value that very much, but for some artists it isn't necessary and they can work anywhere. I really get a lot out of seeing what other people do, and feeling connected to what's going on.

Bonzai: Musically, too?

Anderson: Music, theater, painting. It's not only what I think of as my responsibility as an artist; it's also what makes me happiest—to see other people making things. And that's very easy to do in New York—it's everywhere. That's wonderful. I'm not the kind of artist who works well in complete isolation. I need to know what people are thinking about and what they are talking about.

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Bonzai: Is music visual to you?

Anderson: I do see it visually, but only because I try to make visual things at the same time. I go back and forth a lot. If I am working in the studio on something and get stuck, I can always go and make some images, or video, or film animation.

What I like about music, and what I don't like about something as frozen as film—supposedly it's an art of time, because you go through it, but it's not really—you can suspend time a lot better when you listen to music and use your own imagination. I try to create rhythmic oppositions between music and images, a counterpoint. I think people are capable of absorbing a lot of time signatures simultaneously.

Bonzai: What's on the burner now?

Anderson: I am just starting work on an album now, and I'm working on an electronic theater project. It's a way to combine film and video and electronic props—like a pair of haunted pants that can walk around and sing.

Keiko: What music would you like played at your funeral?

Anderson: Bagpipes—a perfect combination of voice and saxophone. I worked with a bagpipe player named Rufus Harley once. He was living in D.C. at the time and at JFK's funeral there was a contingent of black bagpipe players in kilts coming down the streets and over the hills and dales. He said, "Man, the pipes just spoke to me. I had to learn how to play them."

Keiko: I read that you feel playing keyboards is like driving a car.

Anderson: It's because you have this long dashboard and you have foot pedals and you have a head-on rela-

tionship with your audience. It's very confrontational. I like instruments you can hold—they're more human. The violin is the most human to me because it's like the female voice, and it can "yahhhh"—it really is the saddest instrument ever invented.

Bonzai: Didn't you invent a new violin with playback heads on the instrument which you played with a bow that had pre-recorded tape?

Anderson: It was a way of trying to make the violin talk. And I wanted to sing like a violin. It went both ways. To make the violin talk, and for me to sound like one. So, I tried a lot of different things. I finally ended up putting a speaker in my mouth while I played—a small pillow speaker, the kind you use to learn German while sleeping. You put it in your pillow and play German tapes all night. You wake up speaking perfect, flawless German.

Bonzai: Does it work?

Anderson: No, you dream your own dreams and there is an annoying sound in the background.

Bonzai: So you've taken some chances with your—

Anderson: I've taken some chances with my life—putting things that are electrical in my mouth. I'm essentially a very oral person, so if I see it, I'll either talk about it or I'll put it in my mouth.

Bonzai: Your songs seem so intimate—I imagine that the words, the lyrics, the thoughts in your work come from some sort of very personal notebook or diary.

Anderson: Yes, they do. At the same time that I'm writing regular notebooks about what's going on and what I think, I have other notes about what could happen, or what should have happened.

Bonzai: And these notes surface—

Anderson: The "what could have happened" are the songs. I think that's how it breaks down. I hadn't ever thought of it in that way. ■

Mr. Bonzai, a 15-year veteran of the music industry, is former manager of a major Southern Cal recording studio, and author of Studio Life: The Other Side of the Tracks (Mix Publications).



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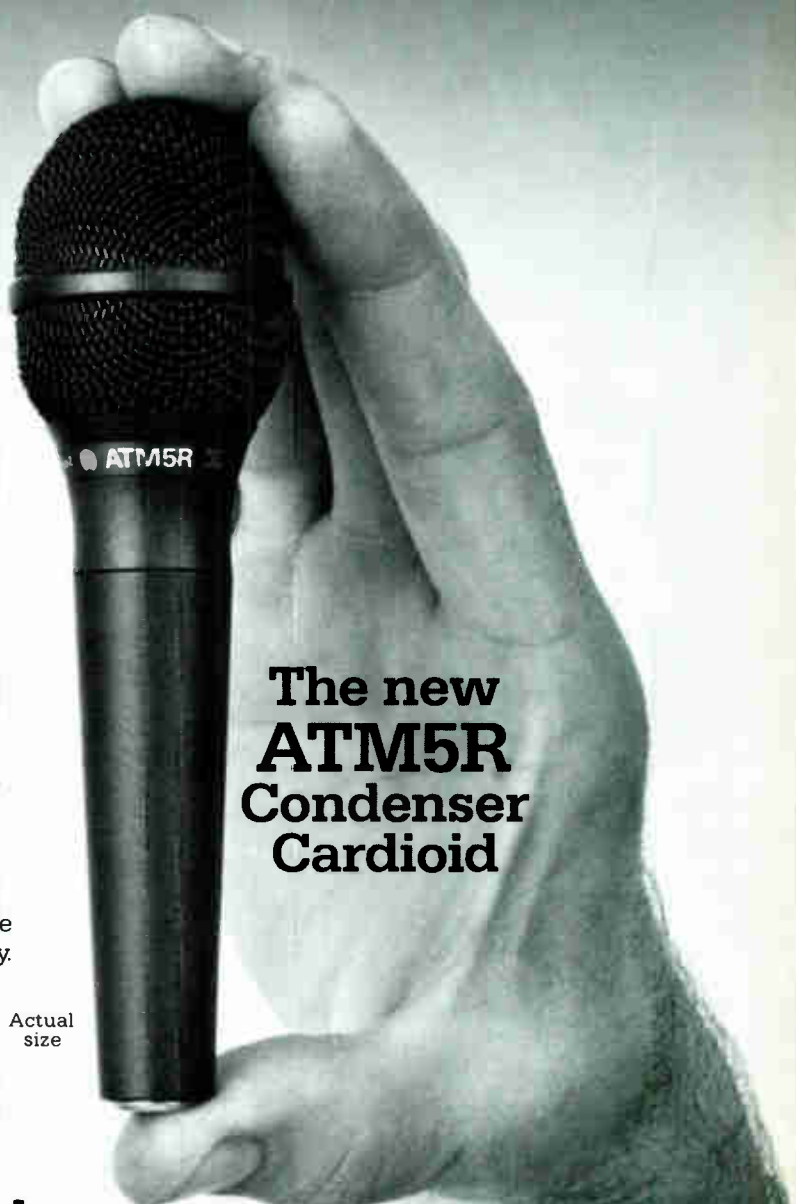
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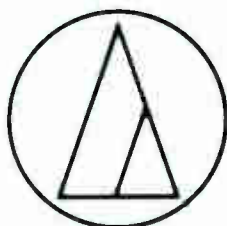
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World Radio History

ORCHESTRAL MIKING

TWO VIEWS

by George Petersen



PHOTO: WALTER HOOGES

“Dealing with the hall is the major challenge facing the recording engineer.”

—JOHN EARGLE

The issue of the selection and placement of microphones has always been a lively topic among recording engineers in all fields, but particularly among classical recordists. The effect of digital recording and compact disc releases on the art of capturing the subtleties and wide dynamic range of orchestral performances has brought every step of the recording chain under intense scrutiny, and the use of microphones is certainly no exception. We talked to representatives from two audiophile labels, and to no surprise, their feelings on the subject of orchestral miking were quite strong indeed.



JOHN EARGLE

Director of Recording, Delos Records

The name John Eargle should be familiar to anyone involved in professional audio. His illustrious career over the past 25 years has included work with RCA and Mercury records, a stint as AES president (1974-1975), and extensive consulting work for leading

audio manufacturers such as JBL. Besides writing the industry standard texts *Sound Recording*, *The Microphone Handbook* and *The Handbook of Recording Engineering*, he has authored over 60 technical articles and papers. Since 1979, Eargle has been associated with Delos International, engineering many of their orchestral, organ and jazz CDs, including Joe Williams' acclaimed *Nothin' But The Blues*, which garnered a Grammy award in 1985.

“The approach to orchestral miking has changed rather substantially over the years. You may be using anywhere from three to 15 microphones depending on what you're doing, but it's not the number of microphones that is important, but how they're handled. Engineers today are looking for much smoother and quieter microphones. The reason is not because digital is edgy—as many people seem to think—but analog presented so many erosions to the signal on its arduous path from studio to vinyl disc that one had to do a lot of bending of the signal to get it sounding right. Once you're in the numerical domain,

if you use the old techniques that you honed during the analog days, you're probably going to be a bit too close, and a little bit edgy sounding.

“This was one of the problems with some of the earlier digital recordings. In recent years, the CD players have gotten better, the recorders have gotten better, and when you combine that with sanity in the microphone department, you end up with a much smoother sound overall.

“I'm not a fan of coincidence pickup [closely spaced mic capsules]—it doesn't give enough feeling of palpable space in a room. It's very analytical, but it doesn't give me a feeling of breadth. My favorite is a slightly spaced, quasi-coincident or near-coincident pair. Basically what I use is an ORTF arrangement [originally developed by French National Broadcasting, this utilizes a spaced pair with capsules 17cm apart and each pointed outward 55 degrees off-axis], and I normally use a pair of Sanken CU-41 microphones for this—they have the best combination of pattern control and low noise that I've found in cardioid mics. For omnidirectionals, I've been very impressed with the Sennheiser MKH-20s—they are extremely quiet and easy to implement.

“My own approach is to place the ORTF pair right behind the conductor

Gerald Schwarz conducts the Seattle Symphony during the Delos recording session. Minor repositioning of the orchestra shell and sealing vestibules resulted in an overall increase of the hall's reverb time by about one second, a significant improvement.

and about 10 feet above, with a flanking pair of omnis mixed in about 6 dB lower to give the image a little more spread. In a deep seating arrangement, I may put another stereo pair over the woodwinds. I rarely mic the back of the orchestra, since the percussion never has a hard time getting out. I often use a spot mic on the first stand of basses for a little more articulation, certainly over the harp and celeste—they ruin their tone completely if played loudly and always need a bit of assistance. If I need some assist from the hall, I'll put another stereo pair about 25 to 30 feet back in the hall.

"These can all be balanced very quickly. I keep elaborate records of relative gain settings for these various microphones and once you start doing that, it's very difficult to miss even the very first downbeat. Whenever possible, I like to mic a rehearsal, just to make sure all of this falls into place, but the big search is for really smooth and quiet microphones and there are some today that are outstanding.

"Rather than spot miking, it's more fun to move the players around—not major redistribution, but moving them back and forward as required. I always make slight modifications for the music: if it's a Wagner program, I will set the orchestra differently than a program of modern music. I would want a deeper seating with the Wagner program; because of the weight of the brass, I would put them back a bit to get a better balance between brass and strings.

"Dealing with the hall is the major challenge facing the recording engineer. This means you have to check out an environment before you try to use it. If you don't, you may find some rude surprises on your hands, and many of these can't be solved on the spur of the moment. Another thing is trying to find a really good room to record in. What I often do is make minor modifications in local acoustics, like closing off vestibules—most concert halls in the United States need to be livened—and reshaping orchestra shells to prevent sound leakage and get more sound out into the hall. In Seattle [on sessions with Gerald Schwarz conducting the Seattle Symphony performing Stravinsky and Prokofiev; Delos CDs #3051 and 3050, respectively], we were able to liven the hall's reverberation time by about a second longer. Every recording you do should be a little bit better than the

previous one, and that should always be the goal."

ADRIAN FARMER

Director of Recording, Nimbus Records

Adrian Farmer began working with UK-based Nimbus Records in 1979, and is not only known as a producer/engineer, but also as an accomplished solo piano artist and classical accompanist. Always regarded as a label on the forefront of technology, Nimbus has been involved with Ambisonic surround recording for over 15 years. The company developed its own CD

mastering system and has now built a CD plant in Charlottesville, Virginia (scheduled to open this month.) Debuting only three weeks ago, one of Farmer's most recent projects was engineering Stravinsky's "Firebird Suite" and "Symphony in Three Movements," performed by the London Symphony Orchestra, Gennadi Rozhdestvensky conducting (Nimbus #5087/5088).

"My role as the director of music here and as the senior producer on sessions is to make sure that what comes through the microphones reflects the sound and excitement I hear when I stand in the hall with the



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PHOTO: WALTER HODGES

A control room discussion between “Firebird” takes. (L to R) Producer Joanna Nickrenz, executive producer Amella Haygood, conductor Gerald Schwarz, engineer John Eargle and members of the Seattle Symphony in the background.

orchestra. So I spend a lot of time *listening* to an orchestra while they rehearse or warm up. I'll put the microphone in a place which, purely by ear, seems to be good, very quickly dash to the control room, and then dash back to the orchestra and listen again. I'll usually do this for about a quarter of an hour, because ears tire very quickly under these circumstances and if you don't have the right mic placement by then, you'll be so totally confused that you won't stand a hope of getting it right, even if you spend another hour at it.

“Obviously, the more time you spend with a particular microphone, the more you can pre-plan for what you think is likely to happen. But every recording is different, orchestras play different on different days and repertoires have varying requirements. You simply have to listen very hard, and decide on that essential compromise you are willing to make. All recordings are a compromise, because no two microphones are as good as a

pair of human ears.

“Very often, there is a conflict. For example, you always get a more satisfactory musical result when the microphones are further away from the people you are recording. If you stand very close to 120 people, you are not going to get the feeling you're hearing the whole sound, but the further you get away, the more likely you are to hear the whole thing working as an entity. The problem with microphones is that they don't have that ability of the human ear to focus in on sounds like a very clever pair of binoculars. If you place a microphone away from an orchestra, you tend to lose impact—you'll get a very beautiful sound, but it won't have any presence. Mic placement is always a compromise between ‘naturalness’ and presence.

“We did a lot of work in the late



Adrian Farmer (center) with actors, discussing the recording of the Mendelssohn/Shakespeare *A Midsummer Night's Dream* with the Scottish Chamber Orchestra.

'60s and early '70s on surround sound—Ambisonic recording. We were involved in the early stages of the Calrec Soundfield microphone, which we used quite extensively during the mid-'70s, and we were very pleased with that. Surround sound is a preferred option over stereo. What we do with surround sound is use one microphone—albeit with four capsules very close together—and just hang it in one place so it is not distorting the internal balance of the orchestra. We don't place a dozen microphones and then falsely try to recreate the balance.

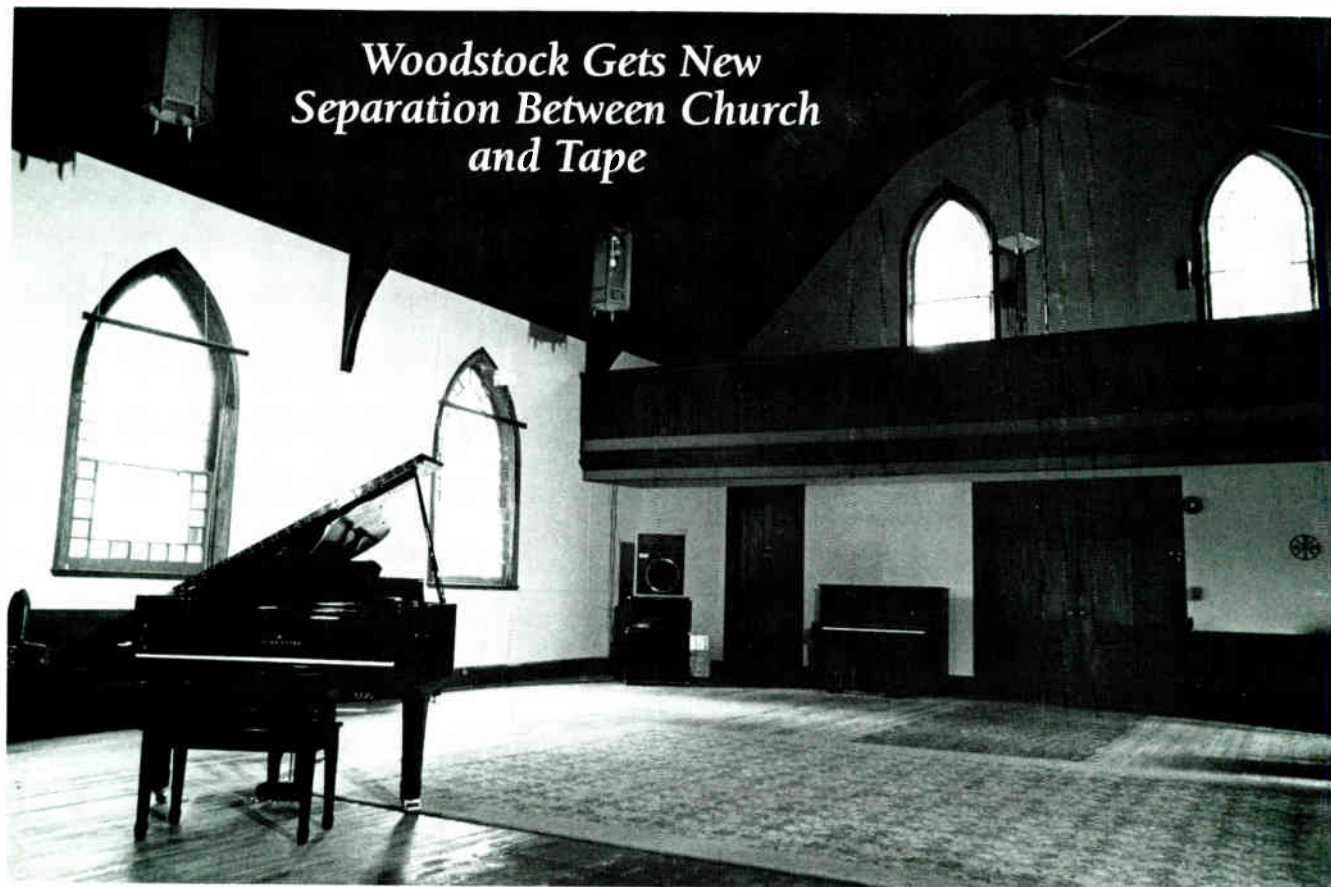
“In the late-'70s, we moved to a microphone of our own electronic design, and we've been using that since 1982. It contains one Bruel & Kjaer omnidirectional, and immediately above and below that—within a millimeter or so—are figure-8 Schoeps, with one facing front-to-back, and one side-to-side. We use that array whether we're recording a piano, string quartet, or 120-piece orchestra playing for the Queen. The capsules are good, with low noise, and the array works very well.

“It's very false to record an orchestra with 30 microphones placed two feet from the players. Of course, most people haven't any conception of that when listening to such a record claiming itself to be stereo: it's not *stereo*—it's pan-potted multi-mono, with a lot of mono mics stuck around the orchestra and pan-potted around to give a false feeling of spread and depth. It's not stereo.

“Our releases are designed to be listened to in surround stereo, though we're perfectly well aware that only a tiny percentage of the world will ever experience that. Our recordings are reasonably stereo-compatible, but the surround sound opens up a new dimension. The reflected information—all the information about what sound does in a hall and the way it's reflected by the walls and ceilings, and then back to the microphone—is 50% of what makes up a performance. That is what the musicians hear and that is how they control their performance, and if you take away that sound, you're depriving the home listeners of a lot of information they need to assess that performance.” ■

Mix associate editor George Petersen lives with his wife and two musical dogs in a century-old Victorian house on an island in San Francisco Bay.

You're Living in DREAMLAND



Woodstock Gets New
Separation Between Church
and Tape

by Dan Daley

When you think of Woodstock, visions of dancing in the mud and dire warnings regarding a particular hue of hallucinogen ("The brown acid is not, specifically, too good.") come to mind. Get a little closer and what you see is a quaint little hamlet with quaint little boutiques whose prices make it clear that tourists are *very* welcome hereabouts.

Down at Duey's most mornings, a few tie-dyed relics from an earlier time congregate over carrot juice and coffee, seemingly oblivious to the fact that time has mutated three days of "Peace, Love & Music" into nearly three decades of meaningless hanging out and scrounging parts to keep the VW microbus running.

But there's still plenty of music in

Woodstock. And for the last year and a half, there's been another place to record it in locally: Dreamland Recording Studios, which occupies a 100-year-old church located in nearby West Hurley.

"Finding the building was a stroke of luck," says owner and studio manager Joel Bluestein. "I looked for a long time for something like this. It had a lot of technical problems that had to be overcome, including new heating, electrical and plumbing systems which had to be installed. But at the same time, I wanted to maintain the special feeling of the building."

The studio, converted from a former Catholic church, is built atop an outcropping of New York State Bluestone rock that had been quarried late in

the last century. That may have something to do with the fact that beneath the church, the ground slopes down and away in an ever-increasing horizontal-V towards where the altar once was, now the site of the current control room. "The way it was designed is that the front of the church is the nodal part of the room and there you can speak in a normal tone and be heard throughout the church," Bluestein explains. "But from the back, it's hard to hear anyone speaking. I'm not sure how much of the acoustical properties were designed in, but I'm sure there's math here that somebody understood. However, there's nobody alive today to tell me."

Bluestein bought the building—which had been used as a theater at

Above: The church received only minimal acoustical treatment.

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one point—for \$90,000 and did much of the electronic and acoustic design himself. A quarter of a million dollars later, Dreamland was up and running.

The overwhelming size of the room is the first thing you notice about Dreamland. The peaked roof (where a pair of PZMs are mounted on either side of the interior slopes), the choir loft and other ecclesiastical vestiges of the building's erstwhile function provide an adventure in microphone placement. The room itself has the ambient characteristics of a church: a combination of wood and glass creating a pastiche of reflective surfaces. The room has received only minimal acoustical treatment, according to Bluestein. "Why fix it if it's not broken? This room is conceived around the idea that synthesizers and MIDI and computers are great, but we have an excellent acoustical environment here and there's still a very big demand for a room like this, where players can play and relax and be comfortable. And that explains why we're here and not in Manhattan. There's a consciousness at work here that's more than just music business.

"There is a consciousness at work here that's more than just music business. There's space available here for the spirit as well as the body."

There's space available here for the spirit as well as the body."

Dave Cook, Dreamland's chief engineer, began there in November of 1985, shortly before the studio opened in March of 1986 and after stints working at Manny's Music and at Prince Studio for four years. He's a musician, a guitarist, specifically; according to Bluestein, a musical background is a prerequisite for everyone who works at Dreamland.

Cook says that the sound and the general vibe of the place are what makes it unique. "It might sound spacey," he says, "but when I first walked in here I felt something. Maybe from the sense of history of the building. I

don't know. But the place works on more than just a technological level. I've met so many people from around here who tell me that they were confirmed or married in this church, or that their grandparents were."

(The studio also has a resident ghost, known as "The Rev," a former pastor whose untimely demise is linked with the heating system in a way that only Stephen King could envisage.)

Cook allows that the only way to effectively work a room of such large proportions is through expert use of gates: "The room is amazing for rock ballads when you leave it wide open. For quicker tempo things, you have to watch it or you wind up gating out most of it."

The studio uses a pair of Valley People Dynamite gates and three dbx 904 gates. However, Cook and his assistant Harvey Sorgen prefer the three Drawmer DS201 stereo gates available in the control room, especially for their response time. "On the Drawmers, the EQ—external or internal—is always effective," says Cook. "And it goes to 25K so even if there's

The new master recording process



extraneous stuff that falsely triggers it, you can get rid of it. They're amazing gates in a big room.

"I use the room as a chamber a lot, with the mounted PZMs in the ceiling. I learn something new every time I use the room. You stand up in the choir loft when someone like Jerry Marotta is whacking a snare and you hear this envelope of high end, a big whoosh. I've mounted PZMs in different spots in the choir loft to try to capture that sound. Interestingly, Jay Bender [Dreamland's resident tech and maintenance engineer] helped design a modification to inexpensive Radio Shack PZMs, including adding a power supply. That idea was originally brought to our attention by [freelance engineer] Mark Mandelbaum," says Cook. "With the mod and shortened cables, we threw it up against the Crown and no one could tell the difference."

In addition to a Studer A80 Mk IV 24-track deck in the primary room (there is a pre-production/recording room in the facility with an MCI JH-24-16 and an MCI 428 20 x 20 console), UREI 813Bs and a full array of

"There is a concept here that everyone is a human being and if they don't know as much as someone else, they should be taught—both electronically and spiritually."

outboard gear, the studio has an exceptional collection of mics. "There's a trend to do a lot of things direct these days," says Bluestein. "You forget how wonderful a good mic can make things. The board is virtually transparent so you can really hear the microphones here."

Dreamland also sports a rather interesting bit of arcane technicalia: an API 3232 36 x 16 x 32 console, one of the last two built by the API factory in the late 1970s.

"The console came from Sound Ideas in Manhattan, where it was probably used on some of the Steely Dan records," says Bluestein, whose love affair with the console is evident right

from the start. "I love the [556] EQs and the fact that the circuitry is discrete. The old discrete circuitry has a lot of characteristics about it that make it very desirable. The amount of junctions in the board makes its bass response great and with very little slewing." Bluestein also likes the absence of onboard signal processing, since he prefers the variety he gets by amassing outboard items. "Once you go outboard to non-automated devices, your automation isn't of much use to you anyway," he argues.

Bluestein and company had to rebuild the console considerably after he acquired it. "Paul Wolk at API has been very helpful in tracking down spare parts." Bluestein is considering installing a moving fader system for the console: "Mixing on the API is still something of an adventure, because it is a primitive board [compared to an SSL]; it has inherent limitations that have to be worked with; for instance, some of the effects sends are ganged, which is a little strange in this day and age, and it's very ground-sensitive. We've also installed our own mute switches. But there's still a lot of

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Although varying in performance and complexity, most Eq. designs have followed either of two classic principles:

parametric: or more usually 'semi-parametric equalisers are almost universally used on console input channels. Normally comprising four filters, two (or sometimes four) of the filters can be 'swept' up or down the audio band to centre on the exact frequency needing attention. Proven to work very well, semi-parametric eq's have two major disadvantages:

1. A tendency for audible phase shift 'ringing'
2. A limited ability to control the entire audio band at one time

For example: having used the 'high mid' to suppress the 'edge' on a singer's voice, there is no facility left to boost the critical 'presence' frequencies that lie either side of the unwanted frequencies that have just been cut.

graphic: normally used for system and room equalisation, graphic equalisers use multiple, fixed frequency, fixed bandwidth filters, to generate gentle, essentially phase-free control over the entire audio band.

The graphic principle has one major disadvantage:

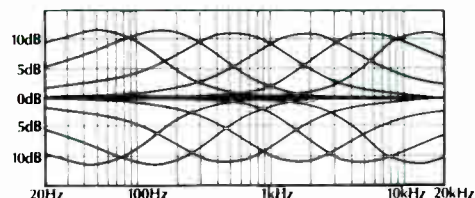
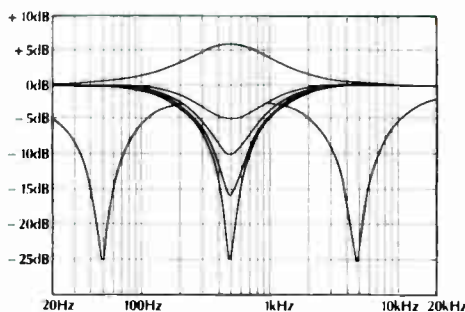
1. A limited ability to control narrow band problems.
- For example: although frequencies in the 'presence' band can be easily and cleanly boosted, that annoying 'edge' to the singer's voice gets boosted as well.

Up until now Hill Audio has uniquely offered the graphic solution on their consoles, believing the ability to keep good control over the entire audio band is preferable to having greater control over just part of it.

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flexibility in there. And you'll get an incredibly crisp mix off this board. It's in there. We happen to be one of the few well-maintained APIs around and simply on the strength of that, we get calls from some of our clients."

Nestled among the rim of the Catskill Mountains about 100 miles north of Manhattan, Bluestein doesn't flinch when the rusticity of his surroundings is pointed out. The proximity of Bears-ville Studios doesn't intimidate him either. "There are a lot of small studios here now, and things are developing in the area," he says. "This is a very active audio professional area, although most people don't realize that. Carla Bley has a studio up here. Others too. We all know each other and we get along. A lot of the better musicians up here, like Jerry Marotta and Tony Levin, go back and forth between here and Bearsville. Also guitarist Bobby Messano [Steve Win-wood, Lou Gramm]. Most of the people from The Band are still here. John Sebastian is here, Robbie Dupree, a great singer, Pat Metheny.

"The area can support what we have now but the future can be limited. Developing a clientele outside of this area is not that easy. Bearsville's been here for 15 years so they have an established clientele. If you really want to be viable in an environment like this and make quality records, you have to have something no one else has, or you have to offer a point of view. Bearsville has a big room, we have a big room, so that puts us head-to-head. The market up here is going



Exterior of the 100-year-old facility.

to get tighter and tighter and the record business is staying pretty stable in terms of how it will fund records. So I wish anyone who wants to come up and compete with me or Bearsville good luck."

The point of view that Bluestein offers at Dreamland revolves around a respect for the karmic aspects of the music business. (It isn't unusual to find, seated in the familial community kitchen in the rear of the rectory, the local faith healer.)

"I manage the place from that point of view," he says. "That I can't possibly know everything. We have a very strange concatenation of people up here, and I often feel that with the diverse group of people who pass

through the studio because of the consciousness that's at work here, I wonder whether I'll ever find people punching each other out in the back room because they don't like what each other believes," he laughs.

"One thing I feel strongly about is the studio hierarchy system I've encountered in so many studios, where right from the boss on down, the low guy on the totem pole gets screamed at; he's an asshole until he learns what he's doing. We don't function that way here. There is a concept here that everyone is a human being and if they don't know as much as someone else they should be taught—both electronically and spiritually. Even if they screw up, they're still treated with respect because they have to go out of here into the world, and this environment should be a healthy one.

"The great thing about being up here with this sort of approach," Bluestein continues, "is that it gives people a chance to meet other people and to express things that they wouldn't be able to in another environment. There isn't such a closed view of the world here because we're so far away from the stress and strain of the big city, and that allows people to breathe a little more. That kind of flow of ideas is why I started the place." ■

Dan Daley is a freelance writer, composer and owner of Pyramid Recording in NYC. Despite the fact that he has several pop and R&B hits to his credit, the guy writes romance novels. Or maybe it's because of that fact?

API console and instruments in the studio's control room.



by George Petersen

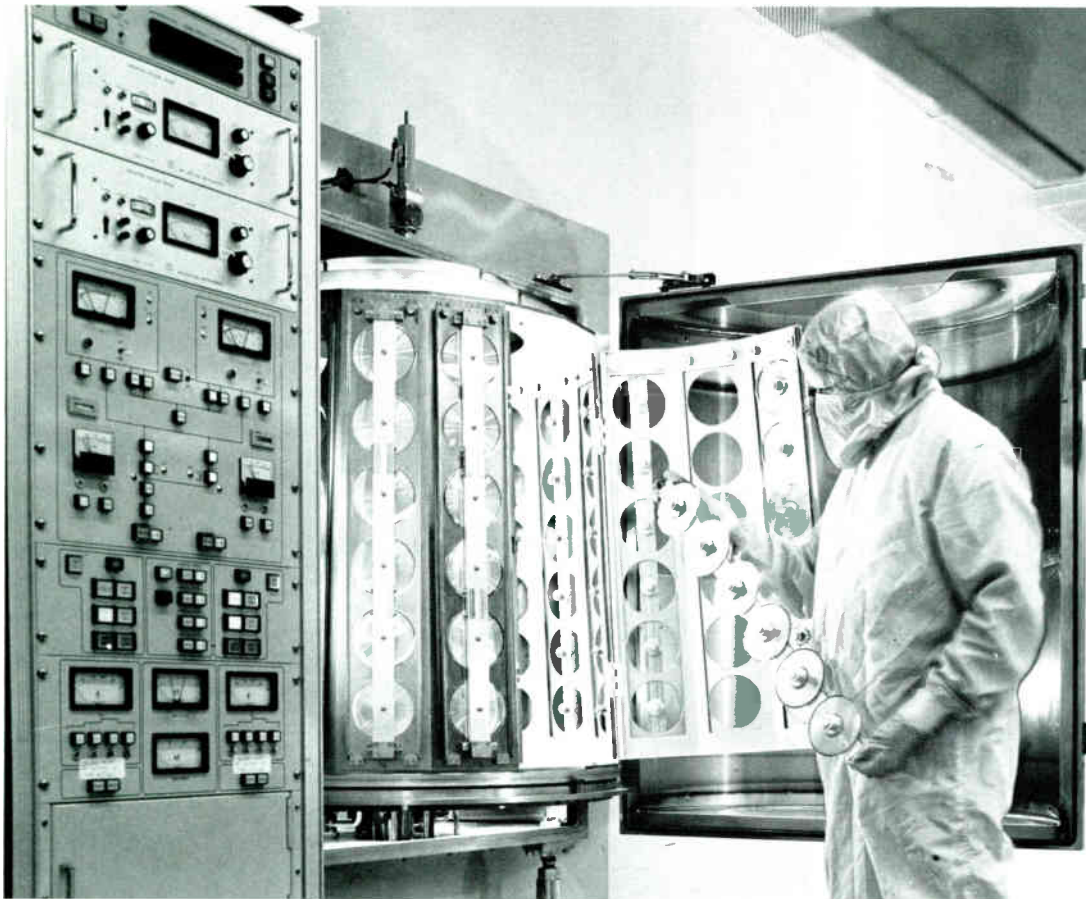
BITS & PIECES

AUSSIE CD PLANT GOES ON-LINE

Located in the Melbourne suburb of Braeside, Disctronics is Australia's first CD plant, set up through the investment of over \$40 million by Disctronics Ltd., and its owners, Pro Image Studios and Quatro Ltd. Since launching its premiere disc—John Farnham's *Whispering Jack*, on May 21 of this year—complete digital mastering capabilities have been added to the manufacturing plant so production from

master tape to finished CD can take only a few weeks.

Quality standards at the plant are said to be among the highest in the world, and product is already exceeding these, largely because of the unique Australian-designed clean air system. The clean air standard for the plant is Class 100 throughout. Most other plants in the world have an overall standard of Class 10,000 (ten times



Disctronics technician inserts CDs for the vacuum metalizing step, where a thin aluminum film is deposited on the disc substrate.

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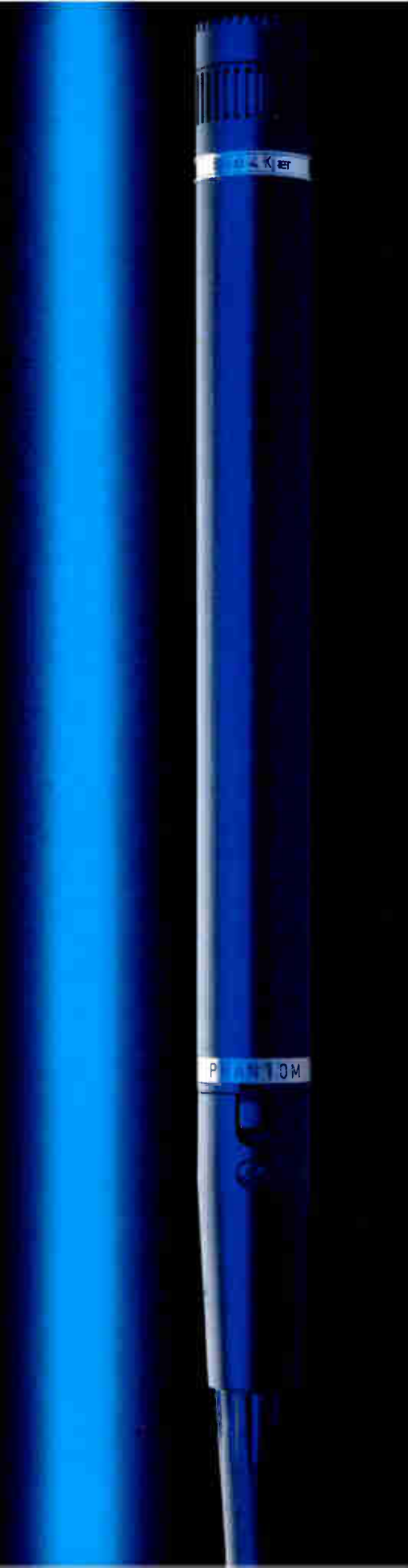
The type 4011 Cardioid Professional Microphone joins the Series 4000 range of Professional Microphones — the product of ten years of research and development by a team of dedicated specialists. The 4011 is a prepolarized condenser-microphone, with a first-order cardioid directional characteristic which combines a flat on-axis frequency response with a uniformly smooth off-axis phase and frequency response. The type 4011 can handle 158dB SPL before clipping. Coupled with extremely low distortion, this gives the type 4011 a sonic performance unequalled by any other cardioid. These design features open up a wide range of application possibilities.

The work Brüel & Kjær's engineers have put into the design of this microphone ensures that it will not become readily obsolete due to rapid advances in technology. The craftsmanship and materials involved in its construction are what make the difference between a good microphone and a superb microphone, and allow the 4011 to be called, justifiably, a work of art. Its technical specifications paint an impressive picture, but there's more to it than that. Put the 4011 to use and you'll find that, for once, what you read translates into what you hear.

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less stringent). Disctronics' extremely high clean-air standard enables a maximal acceptance rate in the manufacturing process and thus a highly cost-efficient operation. The acceptance rate on many of Disctronics' CD runs has been as high as 95%.

The high-precision injection moulding equipment all come from the Meiki Company of Japan, which provided a turnkey operation and supervised installation earlier this year—ahead of schedule and exceeding all anticipated quality standards. The plant was assembled in the Braeside facility earlier this year within a few weeks; in time to produce test runs in early February. Full production runs have been on-line since March.

Disctronics is a first for the Australian music industry, but its impact is greater than just the local market. In fact, over 80% of the first year's projected 25-million-unit production is committed to independent and major record companies in the U.S., U.K. and Europe. This export success is the result of three factors: the highest quality control standards in the world; lower prices made possible by very high production efficiencies (thanks to clean-air superiority); a competitive Australian dollar compared to other currencies; and dedicated worldwide client support programs. The establishment of offices in Sydney, London and Los Angeles, a computerized network to track orders from plant to customer and a committed grid of air freight shipments enables Disctronics to maintain close contact with customers globally—as if they were “just around the corner.”

While the facility already offers exotic services such as gold vacuum metalizing and has established an optical storage subsidiary to develop markets for CD-ROM technology, the Disctronics team is showing no signs of slowing down, according to managing director Roger Richmond-Smith. “Though our plant is now in production, we haven't finished with the improvements. With the installation of Sony laser glass cutters and total mastering facilities, as well as the clean air standards we will maintain at Class 100 throughout the plant, Disctronics intends to remain a world leader in compact disc manufacturing. Our research and development will continue to ad-

vance the state of the art and give us a quality edge as well as the pricing advantage we have over offshore competitors.”

Broadcast '87 in Frankfurt, October 14 through 17

A varied and interesting program of events for those interested in or actively involved in private broadcasting will be featured at “Broadcast '87,” the second international trade fair for film, radio and television. Assembled by Messe Frankfurt, the four-day event includes workshops and live presentations covering all aspects from station management to program color. The emphasis is on private radio stations (where the highest rates of growth are expected in the coming years), as well as private television, where new technology and the availability of new frequencies are likely to ensure a boom in the near future.

For more information, contact Messe Frankfurt GmbH, Frankfurt, West Germany, telephone (069) 7575-394; telex 411558 messe b; or FAX (069) 7575-433.

Turbosound at the Hapoel Games in Israel

Barkai Ltd., Turbosound's agent for Israel, recently was chosen to provide sound reinforcement equipment for the Hapoel Games, Israel's premier sporting event and an important Olympic qualifier. Founded in 1928, the Hapoel Games have grown in size and stature; this year's competition brought together over 1,700 athletes from more than 30 countries.

The system used was truly of “Olympian” proportions. Providing clear sound to every ear during the opening ceremony required 40 Turbosound TSE-111s, 30 TSE-118s, 26 TMS-2s, 6 TSE-260s, 12 TMS-4s, 4 TMW-215s and 8 TMW-212s. The enclosures were arranged in two main stacks and also placed at regular intervals around the entire track.

International Studio News

Kitsch Studio in Brussels, the first Belgian facility to have an SSL console and digital multi-track, has now added a Studer A820 analog 24-track and Fairlight system, along with an entire rack of tube outboard gear to their recording arsenal. . . Convinced by the solid performance of their Soundcraft TS-12 console/Saturn multi-track combination, the Montreal-based studio **Dig-**

ital Music System (DMS) has placed an order for a second TS-12/Saturn setup for their new room. . . And not far away, the **University of Quebec** in Montreal has installed a Soundcraft TS-12 in the recording studio of their music department. . . Rush guitar player **Alex Lifeson** has also upgraded his home facility with a TS-12 board, supplied by Teletch Electronics, based in London, Ontario. . . Some new staff additions at **Le Studio Andre Perry**, Morin Heights, Quebec, are house engineer Glen Robinson, whose credits include Luba, Uzeb, Chick Corea (live), and Robert Charlebois; and studio manager Francine Mercure, formerly of Words & Music Productions and the CBC Audio Products Division. . . Moving eastward across the Atlantic, some recent installations of DDA consoles in European studios went to **Tape One** in London, who purchased their third DDA board, a 6/2 S-Series console for analog mastering; world famous **Abbey Road Studios** bought their fourth DDA console, a 16/2 D-Series for mobile digital recording; and **Scacco Matto Studios** (Lavagne, Italy) has received a large-frame 44/24/2 AMR 24 with 64 channel Audio Kinetics MasterMix. . . Solid State Logic technology debuts in Finland with two SL4000E consoles going to **Takomo** in Helsinki, one of the first 24-track studios in that country. The studio is now ten years old, and was originally comprised of two 16-track rooms built to a Tom Hidley/Eastlake design in 1977. . . In other SSL news, **Eurosonic** has installed a second Solid State Logic SL4048E Series console at their facility in the heart of Madrid. The board forms the nucleus of their new Studio Two overdub/remix suite, located above the Studio One which has been SSL-equipped since 1982. Besides offering Sony digital PCM-3324 and Studer A80 multi-tracks, Eurosonic features a main room large enough to accommodate a full orchestra and an isolation booth for string sections. . . On a related note, **Prosound**, the first studio-laboratory in Spain dedicated exclusively to editing and copying in the digital domain, has been established in Madrid. Equipment includes Sony DMR-2000 and 4000, PCM-1630s and DAE-1100s in a comfortable, pleasant atmosphere. Besides digital post, Prosound also offers digital live recording services throughout Spain. ■

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—**Mix Magazine**



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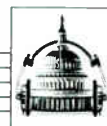
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PRODUCING IN THE EIGHTIES:

BOB LANOIS



PRODUCERS: WHAT IS HIP?

by Rachel McBeth

Question: How many producers does it take to screw in a lightbulb?

Punchline: I don't know. What do you think?

The prankster who crafted this variation on the lightbulb joke obviously didn't know many real producers. In fact, if most top producers share one common denominator, it's that they tend to possess strong opinions. This was well illustrated by the riotous debate on the producers' panel at this year's New Music Seminar.

Assembled in New York that sultry summer day were some of this generation's hottest producers. The panel included Bernard Edwards (producer of Chic, Duran Duran, Robert Palmer, ABC); Jay King (Timex Social Club, Club Nouveau); Daniel Lanois (U2, Peter Gabriel, Brian Eno, Robbie Robertson); Russ Titelman (Ricki Lee Jones, James Taylor, Steve Winwood, Chaka Kahn); Eddie Kramer (Jimi Hendrix, Kiss, Twisted Sister); Todd Rundgren (Hall & Oates, Psychedelic Furs, XTC, Cheap Trick); and Ish Ledesma (Company B, Foxy, Promised Circle).

What follows are some spirited excerpts on a variety of topics from that afternoon's proceedings.

On Selecting Projects

Edwards: What I try to do is find bands that sound different. A lot of groups

The musicians and the producer have a responsibility to the songs.

—DANIEL LANOIS

come out and they're such imitators. I like to hear a new sound or groove and to get involved in new things, to give me enthusiasm. I look for people who are just starting up or guys who want to do something different. It's a lot more fun than to be in the studio doing the standard production thing with strings, horns and girls. A lot of artists come to you because of your sound and sometimes it won't apply. You've got to have good judgment.

King: I choose to work with artists who have some type of direction, who already know what they want to do. I just pave the road for them and build onto what they're doing.

Ledesma: I would basically work with anybody because you never really know what's going to happen.

Rundgren: One of the prime factors in deciding to do a project is thinking

—CONTINUED ON PAGE 88

By the end of the '80s, the most successful record producers will all be former club DJs.

—JELLYBEAN

JELLYBEAN BENITEZ Up From the Clubs

by Iain Blair

The name "Jellybean" has been something of a trademark in the record business since the early '80s—a trademark guaranteeing an explosive sound, a blistering beat, and usually resulting in a hit. To insiders, the legend "Mixed by Jellybean Benitez" meant a record had been specially remixed and sonically remodeled to the demanding specifications of dance club DJs and their equally demanding audiences.

By his early 20s, Jellybean was New York's top disco DJ, and he soon began to work his remix magic on a string of superstars including Madonna, Sting, Paul McCartney, Michael Jackson, David Bowie, Pat Benatar and Huey Lewis & The News, to name a few.

Never one to sit still for long, Jellybean also branched out into production (his first credit was "Holiday" for Madonna), and in 1985 he also signed a production deal with Warner Bros., to develop both new talent and his own burgeoning career as an artist. To no one's surprise, he quickly became the first club DJ to hit the pop Top 20 as a performer when his first album, *Wotupski*, spawned two hits, "Sidewalk Talk" and "Mexican."

Now, two years later, he's just released his second album, *Just Visiting*

—CONTINUED ON PAGE 93



PHILLIP DIXON



TOM WERMAN Metal Magician

by Hank Bordowitz

What would motivate a man to actually want to go into the studio with dangerous rock bands like Motley Crue, Molly Hatchet and Krokus? What would possess a man to sign a madman like Ted Nugent? "I like that kind of music. I honestly do."

Tom Werman's love of hard rock has led him to carve out a special niche among today's producers—a very successful niche where heavy metal is more than music; it hangs on the wall in frames and denotes sales in the millions. His love of metal has not only made him one of the most successful producers on the scene today, it helped him through gigs in A&R previously.

"I signed a lot of bands to Epic before I left," Werman says of his A&R days. "I tried to sign a lot of bands before they let me sign Ted Nugent. I tried to sign Kiss, and Lynyrd Skynyrd and Rush and Manhattan Transfer, and CBS turned them all down. So then they said, 'All right, Werman, what do you want to do now?' We signed Ted and we were off and running."

Werman has yet to stop. As a producer, his credits include Cheap Trick's

If you try to contrive a specific approach, you're not going to do your job. That depends on the band.

—TOM WERMAN

Heaven Tonight, the first five Molly Hatchet albums, half a dozen of Nugent's most successful discs, Twisted Sister's *Stay Hungry* and the last three Motley Crue records. Even if this is not your cup of musical tea, it is evident that he is doing something right. He does not, however, have any special formula for making great hard rock records.

"I think, if you try to contrive a specific approach, you're not going to do your job," he says. "That depends on the band. Obviously, the better job you do, the fewer overdubs you're going to have to do. If you arrange the

—CONTINUED ON PAGE 97

A producer is somebody who can bring the best out of a song and make it sound good.

—JIMMY JAM

JIMMY JAM & TERRY LEWIS A Fast "Flyte" to the Top

by Hank Bordowitz

"I think it's given us a bigger sense of responsibility," Jimmy "Jam" Harris reflects on winning a Grammy Award. "It's that extra little thing that says, before you were just producers, and now you're *Grammy Award-winning producers*, so now that name is just a little bit heavier."

In other words, winning a Grammy puts just that much more pressure on two guys who are rapidly becoming the hardest working producers in show business. Not only do Jam and his more taciturn partner Terry Lewis head Flyte Time Productions, the company responsible for writing hits like "I Didn't Mean To Turn You On," and producing major hits like the Human League's "Human" and Janet Jackson's Grammy-winning *Control* album, but they also are working on their own album and, in their copious spare time, run a custom label for CBS.

"Labels are a headache, believe me," Jam moans. "People always ask us whether we're going to sign other artists, and we say 'No, we're going to sign producers, so we can train other people to do what we do as producers.' Rather than artists who need producers, we'd rather nurture a songwriter or producer."

—CONTINUED ON PAGE 99





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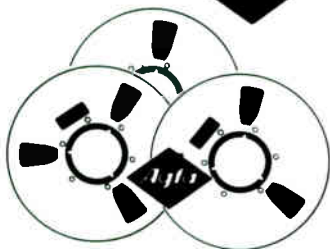


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—FROM PAGE 86, 'HIP

that I can do it differently than somebody else can do it or that I have some special sensibility about it. If it seems like another producer could do it just as easily as me, there doesn't seem any point in me doing it, regardless of how much I like the band. My preference is to deal with artists who have a real confidence about their material and their performance of it, and generally just want an objective ear.

On Pre-production

Rundgren: Pre-production varies according to the act. For example, with XTC, they've got a concept that is so ethereal that you won't know what you're doing until you actually record something and hear it back. Pre-production in this case [the *Skylarking* LP] consisted of everyone sitting around with guitars staring at each other and deciding, "Yeah, we'd better turn on the tape machine." In other cases, you may have extensive rehearsals trying to minimize the amount of time you spend in the studio, because no producer wants to spend that much time in the "office." Wherever pre-production can shorten that, I think you have to apply the maximum amount of it. It always helps for me to figure out some kind of concept or thread that ties the whole thing together to make the album coherent.

Kramer: For me, pre-production is where you make the record. If it's not happening in pre-production, more than likely it's not going to happen when you hit the studio. You can tell in pre-production if a band can take direction and handle what you're trying

to go for. Song changes should be made in pre-production instead of wasting studio time. The essence of making a record takes place in pre-production.

Titelman: Pre-production varies with the artist. On the Winwood record [*Back in the High Life*] that was perhaps the most intense pre-production work I'd done. We spent a whole week, ten hours a day, editing tape, throwing ideas around and getting the songs into shape. With Randy Newman, it's completely different. He'll have the whole album written and ready to go.
Edwards: I don't really do a lot of pre-production on projects. In doing Robert Palmer's record, we all went down to the Bahamas, had a couple gallons of daiquiris and sat around trying to figure out which tracks to use. Then we started playing. We would take two tracks a day and keep it to that level of production. I don't like to play things a lot. I like the spontaneity. After three or four hundred songs as a producer, you want some sparks.

Ledesma: I used to be into pre-production and it just didn't get me anywhere. Now I just go into the studio and go to work. I'm not into pre-production at all.

King: I do very little pre-production. If I hear something good on a 4-track, I usually keep that same feel. When you put feeling right on tape then people are going to feel it. The eight songs you hear on the Club Nouveau album are the eight songs we wrote and produced. We didn't write anything more or anything less. We did it in three weeks and we were ready to get the hell out of the studio.

The most important thing a producer can do is to get the personality of the artist on tape.

—RUSS TITELMAN

On Producer/Artist Involvement

Titelman: I think basically there are two different categories of involvement. If you're working with an artist who is a producer as well, then it becomes a real collaboration; in the best cases, a lot of ideas will be bounced around and that magic happens. Your role becomes greater if you're working with someone who doesn't write, isn't a musician, or works as a singer. I'll become a lot more involved in arrangements or contributing to the vocal performance. The most important thing a producer can do is to get the personality of the artist on tape.

Rundgren: It varies from act to act how much a producer has to be involved. The function of the producer in general is to make up the difference. It's necessary to be objective because you're supposed to perceive the artist in a way that he doesn't even realize himself—what his strengths and weaknesses are, and to put him in focus for everybody. The hardest thing for me as a producer is keeping the artist from imitating somebody else. There are also things that go way beyond the scope of music. Many people don't realize the degree to which the producer must be a politician—sometimes politics will be the greatest portion of your job.

Edwards: I'm a bass player so a lot of times I am in the band. Being in the band, you can actually control the groove more. You can get the band going and get the reactions from the musicians that you want. Being there, being involved and playing an instrument helps you to get a certain sound and feeling from the track. If you can

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develop and protect the artist-producer relationship, the band will trust you to make a good record and to take care of the music.

King: There's really not much to production if you have a great artist. The people that I work with I really try to involve. If you don't involve the artist, you don't get their feel. Before I did "Family Affair" with David Ruffin and Eddie Kendricks, I went and bought some of their old records and tried to develop a style around their vocal patterns. I wanted them to feel comfortable with the track.

Lanois: I tend to get involved with the band in performance. I'll join them

banging on bits of percussion—that's a good way to get to know people. If you're playing with them, you learn the arrangements fast, you each share ideas, and everything gets developed early on with your knowledge. You become a unit and it creates a certain bond that stays with you throughout the whole production. You should clarify your approach from the beginning. If you develop house rules for yourselves, it makes things a lot clearer while you're working. You can change your mind about things but starting with rules is a good beginning.

Kramer: If you're going to be a producer, you'd better be prepared to be

the father, confessor, psychologist, doctor. . .

Rundgren: . . .the whipping boy!

On Mixing

Edwards: Mixing is very important. You can spend a long time piecing things together because sometimes a song just won't happen right, no matter what you do. And then you can come up with a few effects that will make the song really sound great, and help it sell.

King: I think a record is actually made in the mix. If it's not mixed right, you can actually lose a good record. I'm involved from the production to the mixing to the actual mastering of a record. A producer should be involved with the project on every level in order to see it through the way you feel.

Kramer: Sometimes I hear right away what a song will sound like in the final analysis, after I've mixed it. And I try and carry that thought process all the way through pre-production, recording and overdubbing. I try to keep that thread of what I heard originally that struck my imagination. I try and paint the same picture. Yes, I even hear it in my dreams sometimes.

Rundgren: I think those are called nightmares. I think we as producers tend to forget that most people who listen to records are not paying attention to the sound quality. They react on a more gestalt level. We as producers should reinforce that in ourselves because we're surrogate listeners for the audience at large. A good song can survive a lousy mix, but with a bad song no amount of mixing will make it great. There was a phase when producers were hired totally for their sound, and I think that phase is ending. Records have to have some greater musical validity.

Has Technology Compromised Musicality?

Everyone: No. Yes. No. No. Yes. It's a different process. Just say no.

King: I think that electronics has helped the record industry with sounds. People like to hear new sounds. I use drum machines because I like big drums. All I've ever used is drum machines. They don't make mistakes and can't talk back. I've never used a live drummer and I suspect I never will.

Kramer: But mistakes are part of music. They're cool.

King: That's why I don't like rock



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Many people don't realize the degree to which the producer must be a politician.

—TODD RUNDGREN



RALPH GABRIEL

and roll.

Edwards: James Brown makes mistakes too. I just like to see another person playing an instrument as opposed to someone pressing a button, because my kids can press buttons.

Rundgren: I think you have to make a distinction between style and substance. All the gimmicks can help you with your style but they won't change the substance of what you're doing. Neither a drummer nor a drum machine are justified on a crappy song. People get hung up thinking that the sound is saying something. The sound isn't saying anything; it's the person behind the sound.

King: Obviously you guys come from a different era. I'm 24 and you guys are a little older than I am. I've had five hit records. Obviously, I have some substance and am doing things that people like, hear and understand.

Lanois: Technology offers a group of options. If you can learn to love and understand everything about one item, I think you'll be a lot stronger than trying to incorporate too many components. As long as you have a passion for that one effect or instrument, I think passion will come through in your work.

On Record Companies

Kramer: Producers will sometimes get a general sense of direction from the record company. With the help of management and all other interfering parties, you grit your teeth and try to steer the project. If the natural instinct of the band's music is 180 degrees opposed to that, you come out with a finely crafted piece of product that

means absolutely nothing to what the band was all about. Consequently, the record comes out and it just goes right down the toilet.

Lanois: U2 is a fine example of a manager who did a very good job by acting as a liason between the production/artistic team and the record company. We essentially had very few dealings with the record company. We were left alone to create the record the way we wanted it done and it was delivered in a finished state. The manager did the job of allowing us privacy.

King: I never listen to companies. I don't think you should. Record executives are just that, record executives. They know how to market and promote a record. On a creative level, you should never let a company direct you.

Edwards: If you get the record company involved trying to make your project sound like the latest happening or chart topper, you can rob yourself of a good experience. I usually go right to the artist and get to know them. If you get everyone else involved, it's never going to come out right. It never has.

Rundgren: The producer and the artists are building their reputations on the contents of the record, not on the way it's marketed. It's very disheartening when someone who isn't involved in the process and who is ultimately going to walk away from it after it's finished and not have their name on it, comes in and tries to manipulate it into something that will make their job easier. It doesn't really do any good to pressure an act to be something different than what they actually are. I don't understand why record companies sign some of these people in the



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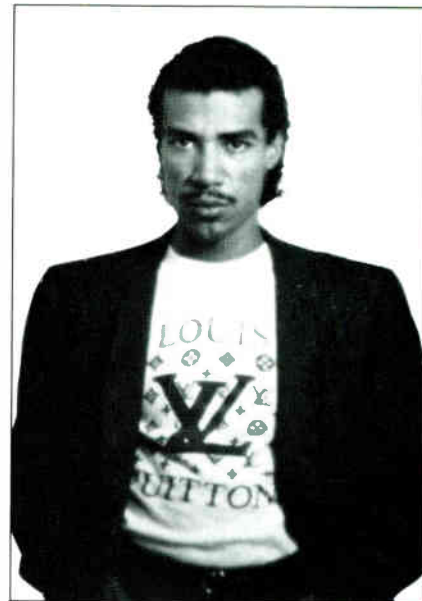
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A producer should be involved with the project on every level to see it through the way you feel.

—JAY KING

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first place if they're not going to let them realize their potential as artists rather than just as merchandise. In some cases it can be kept to an endurable minimum. In some cases it can degrade the quality of the album and even possibly cause it to be less successful than it would be.

A case in point was when "Dear God" was arbitrarily removed from the XTC record because someone didn't like little kids singing on records. [The song was released as a B-side on a single, became immensely popular, and the album was re-released to include the track.] There's also the other situation that most major labels have been conglomeratized, absorbed into greater entertainment corporations, and their policies are run from accounting offices somewhere and have nothing whatsoever to do with music. **Titelman:** I've been at Warner Bros. a long time and there's a creative atmosphere there that's really good. The guy

who's the president of the company [Lenny Waronker] was a producer.

Lanois: I think it's very important for the music to see itself to its own conclusion. The musicians and the producer have a responsibility to the songs. Ultimately, it is not the job of record company executives to be involved in the creative process unless it is at the level of a cottage industry whereby a scene develops from a small seed and at that point the record company interest is, in fact, in the interest of music and not money. I think, whenever possible, finance your own records. That way, you don't have to borrow from a record company. It makes it a lot easier in the end. Otherwise,

you have to sell an awful lot of records before you ever get your share because the loan repayment plan is very severe. So get the money from your father or somebody else. It doesn't always take a lot of money to make records. You can do it in a small way with the best quality you can and get on with it.

King: When you control your own destiny, you will find a lot more energy than when other people are telling you what to do. ■

Using her psych degree from Berkeley as office manager for Mix Publications, Rachel McBeth also explores the neuroses of British rock, German films and American politics.

into the studio and analyze and dissect all these hot tracks and find out exactly what made them tick. Really, I was very lucky, 'cause I learned from the best in the business. There I was, remixing tracks by all these Grammy award-winning producers, guys like Quincy Jones, George Martin, Giorgio Moroder, Jimmy Iovine, Reggie Lucas, Bob Clearmountain, Phil Ramone. That enabled me to learn how they recorded sounds and how they went about building up tracks. The other aspect was psyching myself up for what I knew I wanted to do. I'd look in the mirror every morning and say, "You're going to be a successful record producer—one day."

—FROM PAGE 86, JELLYBEAN

This Planet, on Chrysalis Records. A year in the making, the sessions were squeezed in around Jellybean's hectic, bi-coastal schedule, which has included projects for Whitney Houston, Stacy Lattisaw, The Spinners, a couple of films, and his own Jellybean/Warner acts.

Looking tired but happy, Jellybean discussed his studio techniques, his

film projects, his goals and ambitions, and tried to put it all in some perspective.

Mix: You are the first club DJ to make the Top 20 as a performer. Was it a good training ground for you?

Jellybean: The best. I happened to be around when all the hip-hop, rap and electronic black sounds were starting to cross over, so I was able to go

Mix: How would you describe your new album?

Jellybean: Well, it's not a hardcore club record, although obviously it's heavily influenced by the club scene and the urban radio sound. I basically set out on *Wotupski*, my first album as a producer/artist, to document the club scene and put a twist on it. I wanted *Just Visting This Planet* to further extend that idea, but to also function as a showcase for the other writers, players

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nedy, Jocelyn Brown. You always seem to work with women.

Jellybean: [Laughs] It just seems to work out that way, although I do love working with women. It's really a case of working well together, and you *have* to, to be successful with a record.

Mix: What about times when it doesn't work out?

Jellybean: Yeah, there have been those, too. I remember when I remixed Sting's "If You Love Somebody Set Them Free." I brought in Paulinho DaCosta to add some percussion and bongos. I thought the result was great, 'cause it took it in a completely differ-

ent direction, and made it this great dance track. But to my great surprise, Sting didn't like it at all. He felt he'd made this very '60s record, and I'd turned it into this hot dance track that was very '80s. I still think it's the best dance cut Sting's ever made, though.

Mix: Your first production was Madonna's "Holiday," and then you produced her number one hit from the film *Vision Quest*, "Crazy For You," and co-produced "Borderline." How did you hook up with her?

Jellybean: At a show I put on at the Funhouse [in NYC]. We just clicked and it was very exciting to work with

her at that time and see her whole act come together. People have accused her of being a little Hitler in the studio, but she was great with me. Another artist at that point in her career might have been far more nervous with me, as it was my first production, but she trusted my instincts.

Mix: You eventually lived together for a year and a half. Are you still friends?

Jellybean: Oh sure. The thing is, we were working together before we became lovers, and then she became this huge star and it all got blown up by the media. But we're still close. Right now, I'm putting together a package of her greatest hits, including "Holiday," "Into The Groove," a new song called "Spotlight," and some other tracks, and segueing them all together in a hot remix. That'll be out later this year sometime, and it'll be great for a real club or party atmosphere.

Mix: What radio do you listen to?

Jellybean: A lot of urban, black stations. I like crossover hits with more mass appeal, songs that get played on both black and white stations. Radio is still very segregated and a lot slower than the clubs to pick up on something. To hear new music, I always hit the clubs—that's where it's happening.

Mix: While you worked on your new album, you also found time to produce Whitney Houston, Stacy Lattisaw, The Spinners and your own Jellybean/Warner acts.

Jellybean: Yeah, and time is always the problem. It took a year from cutting the track to finishing the mix to complete "Love Will Save The Day" for Whitney, although we actually only spent eight days doing it. And that was because of our schedules. Thank God she's so easy to work with, a very giving singer who warms up very quickly. But that was typical in that we recorded in both L.A. and New York—at Larrabee, Sigma Sound, the Hit Factory and Sound Track, and then mixed it at Sound Track.

I produced "Nail It To The Wall" for Stacy Lattisaw much quicker, recording at 39th Street Music and Sigma, and then mixing at Sigma. And the *Spaceballs* theme was recorded over one week at Sigma and then the Village Recorders in L.A., and mixed at Larrabee.

Mix: What about your film projects? In

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addition to *Spaceballs*, you're also music supervisor in the upcoming *The Principle*.

Jellybean: It's an area I really want to expand. Of course, before I was involved in *Vision Quest* and then *Fast Forward* with the track by Siedah Garrett, but *The Principle* is the first time I've served as the music supervisor, and it's been very enjoyable. I'm working out of Lion Gate Studios, and I've also been involved since before principal photography began back last March. That's unusual, but to me it makes far more sense than just pushing in songs at the last minute as they usually do.

Of course, film is really a director's medium, and I don't have the same control I have in the studio. But I'm a very visual person, and it's an area I feel very comfortable in. I think in terms of colors in the studio, picturing sounds mentally, so it's a natural progression for me to do this.

Mix: What about the future?

Jellybean: I definitely want to work on more film projects, and keep developing the acts on my label and my

own solo career. I think it's very important to keep upgrading your goals as you go. When I started as a DJ in the South Bronx, that was all I could see. And all my opportunities came from being a DJ, and I took them as they came. I *never* dreamed I'd become a producer, an artist, and have my own record label and publishing company.

And I really owe most of it to my days in the clubs. You *have* to know what to play, and how to entertain people, and be prepared to take chances. That's why I believe that by the end of the '80s, the most successful record producers will all be former club DJs. They're the wave of the future. Before, it's always been engineers, and then musicians and arrangers who've turned producer. Now it's the turn of the club DJs. Look at the charts—their influence is everywhere, and it's only just beginning to be felt. ■

"Count" Iain Blair, British writer, musician, and author, was an original cast member of the Rocky Horror Show and the film version for 20th Century Fox. He's currently writing screenplays in Los Angeles.

—FROM PAGE 87, WERMAN

song right in pre-production, you're going to be able to get away with very few tracks and have records that sound like they are not layered from Hell. It has to be different with every band. I don't spend a lot of time in pre-production. We just rehearse the basic tracks. But I like what happens in the studio, and I like to be able to change directions quickly, in mid-stream in the studio, to take advantage of mistakes, go with things that weren't planned and to be very flexible and pragmatic. And I love to have a good time."

Werman gives a lot of the credit for his recent success to his engineer, Duane Barron. "For the last two years I've been working with Duane," he says. "I got him, actually, when he was very new—well, not new, but he was pretty young at the time, just 24. He had just done two Quiet Riot albums. We just started working together then; [Motley Crue's] *Theater of Pain* was the first thing we did, and we've been working together ever since.

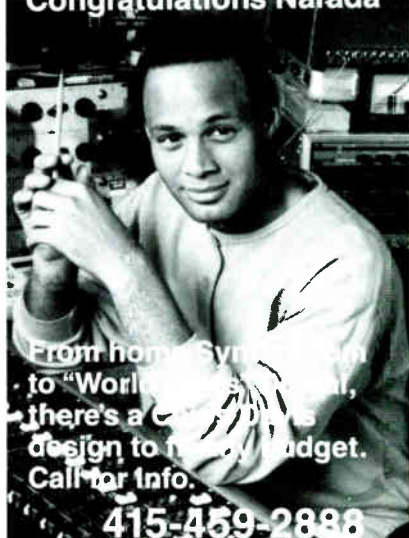
"I'm tone deaf when it comes to the technical side of things," Werman adds. "I'm in tune with the technical side of things only so far as I know what they do. I rely, almost 100%, on

Duane for operational performance. He'll get the sound that he wants on something, then he'll turn to me and say, 'Well, how do you like that?' And I'll say, 'I want that a little darker, I want it a little lighter, a little brighter, I want a little more reverb on it, I want to put it through something,' and he'll do it, or he'll come up with an idea of his own. The longer we work together, the less I have to say. My end is restricted much more to the musical—arrangement, the lyric, the concept end."

Werman cites Nugent as a case in point. Through 1975, Nugent had been a disappointment to his record companies, both as a solo artist and with his legendary '60s band The Amboy Dukes. "When I happened upon Ted Nugent in 1976," Werman points out, "I signed him to CBS, for whom I was working at the time. I thought that it would be easy to make records with this guy. I didn't understand why his records hadn't sold a lot up to that point. So I just went into the studio with him, and we had five platinum records in a row. It was real easy for me. I just went into the studio and made a record that I thought was naturally right for the artist I was working with. And it worked. It was natural. I

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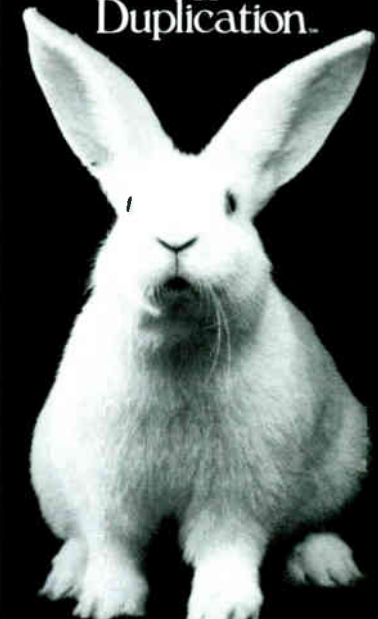
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didn't try to put any artificial force in there. It worked too, for Cheap Trick and Molly Hatchet, and everybody else."

There also have been a few failures, records that were frustrating to make. One of Werman's most recent and infuriating experiences involved Krokus. Werman was called in to produce their last studio album, *Change Of Address*. Not only wasn't this the album that made Krokus an international hard rock force to be reckoned with, it was an abysmal failure, panned by critics and the faithful alike. Worse than this, though, was the reaction of the band's lead singer, Marc Storace, who went around blaming Werman for the record's failure.

"This guy never said a word to me during the session, and then six months later, all of a sudden, I read this garbage," Werman fumes. "In fact, Marc Storace is the only person who has ever bad-mouthed me in print after the record was done. Every other artist, every other band that I've worked with, has had at least reasonably nice things to say. Anything from reasonably nice to absolute raves."

As it turns out, it was a bad situation all around. Krokus leader Fernando Von Arb wanted to try to make a more accessible record to try to change Krokus' image as AC/DC clones and rock dinosaurs. And so they tried something different from what the band and the producer were used to. "I'm not used to doing pop records," Werman admits. "I usually do more aggressive records. Naturally, Krokus is a rock and roll band. Many consider it a heavy metal band. So I wanted to make a heavy metal record, a record that had songs on it like 'Eat The Rich' and 'Long Stick Goes Boom.' But Fernando and Marc both said, repeatedly, 'We don't want to make a slam-bam record. We want to make a record for the '80s, with all these great sounds. A thinking man's record.' That's when they finally came up with 'Burning Up The Night,' which was, as far as Duane and I are concerned, a horrible song. It was extremely wimpy and never should have been on the record in the first place. They wanted it, their label wanted it, they didn't listen."

On cheerier fronts, one of Werman's most recent projects was a record that he regards as one of his best—the new record by Motley Crue, *Girls Girls Girls*. Werman feels this is the disc that will establish the bad

boys from L.A. as heavy metal contenders, and so far the sales seem to bear him out.

"With *Theater Of Pain*," Werman comments on the previous Crue effort, "we were casting around a little bit. It was not our favorite. It wasn't my favorite, it wasn't [bandleader] Nikki Sixx's favorite. I know the band thinks that the first two albums, *Too Fast For Love* and *Shout At The Devil*, were much more aggressive. This one is back in the pocket as far as aggression. It's just a great album. I'm not going to hype it. It's wonderful, and I think it's way beyond themselves in terms of where they started out. I think once people hear this, they'll understand that they're going to be around for a while."

While Werman is after a muscular quality in his music, he is not trying to make records exclusively for head-bangers. "I don't think that Motley Crue is necessarily headbanging," he says. "And Ted Nugent . . . I suppose *he* was headbanging. But really, I think it's more like hard rock, what I do. I don't think I'd be comfortable doing an Accept record, or Iron Maiden. I don't even have any Iron Maiden in my collection. I don't even listen to heavy metal in my off time. I listen to ZZ Top more. To me that's hard rock. I think there's a difference there."

Coming off the success of the new Crue record, Werman has several potential projects, including records with Poison and—what's this?—the Motor City Madman himself. "I'm going to work with Ted again, on three new songs," he says. "Here's an honest guy. I left him years ago. He didn't want to change the way I wanted him to change, so I said good luck and we remained friends. And he comes back and he says, 'I think this material I'm writing now warrants your approach with me, so let's do it again.' I said, 'I'm honored, so let's do it again.'"

"A producer is simply a hired hand," he concludes. "He's there to assist the artist or band in making their record. You make the record the band wants to make. You don't tell the band what kind of record they're going to make." ■

Hank Bordowitz is a NYC-based writer, editor, and critic who cut his teeth in 8-track recording studios. He writes for a multitude of mags, from Mix to High Fidelity, and currently is editing a new magazine, Rock Fever.

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—FROM PAGE 87, JAM & LEWIS

This philosophy has led Jam and Lewis to half-jokingly propose the Jam/Lewis Music Business Academy. Here, aspiring stars could reconsider the rocky road of a performer and instead come to grips with something more behind-the-scenes but equally rewarding. Like what Lewis and Jam do.

"We try and educate as much as we can," Jam maintains, "but we see a lack in the management field. Especially of black managers and black entertainment lawyers and that type of thing. I would hope that people in their respective fields would try to encourage people to go into those fields."

The Flyte Time team owes a lot to their own manager. In a time rife with stories about artists—particularly black artists—being used and spit out by bad management, Jam and Lewis have nothing but praise for their current manager, Clarence Aamons.

"Interesting story about Clarence," Jam relates. "Talk about a man who's fair. We once had a manager who didn't really know what she was doing, although I do give her credit for giving us the initial push into production, because she was the one who got people to listen to our demo tape. She's now a very successful manager, but she went in and made a deal for us. Clarence called us into his office: 'Yeah, I talked to your manager about this deal. And I got a question about this money that she's asking.' Now I'm thinking, 'Oh, god. She went in and asked too much and now he's pissed off.' And he says, 'I don't think she asked for enough money. Here's what I think is fair, here's what I'm going to pay you.' We were really stunned.

"That was the beginning of the relationship," he continues. "At the time, Clarence was getting ready to get out of the record business. I don't know what he was going to do, but he was just fed up with the record business. We told him, 'Clarence, you'd better stay in. We're going to make it worth your while. We're going to have fun. You're going to have fun with the record business again, and you're going to love it.' And that's what we've done. He's been an inspiration to us in every possible way. Business-wise, he makes our deals for us. That's one end that we don't have to worry about, because he really watches out for us, and hopefully that's a two-way street, because hopefully we're making him



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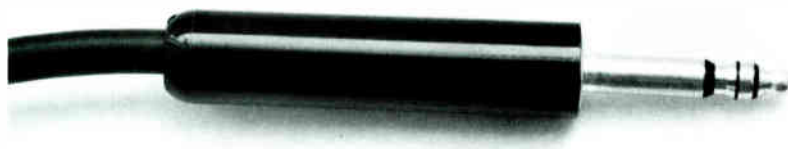
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happy by being successful in the business and stuff."

So all Lewis and Jam have to concentrate on is getting it right in the studio. While their success in that endeavor speaks for itself, it doesn't happen without a little help. They get most of this from their engineer, Steve Hodge.

"We had a good thing happen to us," Jam says. "We had an engineer walk out on us when we first built our studio. So, we had to learn to work the studio by ourselves. We engineered the Cherelle LP, which went gold, we engineered Janet's LP. Steve Hodge came in at the end and fixed it. So, we do know about that. We don't know *why* things work, but we do know how to work in the studio.

"Steve Hodge has a fantastic history of acts before us," Jam enthuses about their aural fix-it man. "One of the reasons we got turned onto him was that during one year, a producer named Leon Sylvers had an incredible string of hit records. Steve Hodge mixed on every one of those records. We recognized at that point that an engineer is very important, because we'd worked with a lot of different engineers, and have had the most success with Steve Hodge.

"I like to say, if it's a shoe or a car, it doesn't matter how good a shoe or a car it is, if it's not shined up, nobody's going to buy it. The engineer, Steve, puts that final gloss on everything. He takes what was a good song, and makes the song presentable in its final form, takes it from the rough stage to a polished stage. He does it in a very non-technical way. He has a very technical mind, but his sensibilities are very human. He doesn't get into a lot of technology for technology's sake."

Nor do Jam and Lewis. They prefer to make things easy on themselves, if not with their work schedule, then in the studio itself. They play a great deal of what you hear on Flyte Time productions, and their approach to the instruments, like their approach to the music, is straightforward.

"As far as keyboards and things like that go, I'm pretty much a pre-set guy," Jam says. "I figure that when you buy a Yamaha keyboard, these people get paid money to come up with these factory programs. If the guy who's getting paid can't come up with decent programs, I'm not getting paid for coming up with these programs. So if I can plug in a synthesizer or

sampler that has already got a great library of sounds, I'm happy with that, because I like to just turn it on and go for it. But we use a lot of old analog keyboards like the OB8, and we use a lot of cheap samplers, like the Mirage. To Steve Hodge's credit, he makes everything sound good and blend together."

While many producers come from the ranks of engineers, Lewis and Jam have performance backgrounds. Both once belonged to The Time, one of the most successful bands to come out of the Minnesota soul scene of the late '70s. Ironically, it was their urge to produce that ultimately did the band in.

"During the time we were performing, we were writing," Jam says. "Some of our best ideas come from performing because it's an instant feedback situation. We would try to be spontaneous. We would always try to play songs a little different. I would try to do a bass part and I would be able to see if it worked. It was just a natural progression for us to do something different. So it was natural for us to produce, to just sit in the studio and make songs. We sort of fell into the

producer thing because we were writers.

"I feel that a producer is somebody who can bring the best out of a song and make it sound good. I think what we are is writer/producers. I think there are better producers than us—pure producers—but I think that as writer/producers, we do a good job of bringing what we write out, of doing a good presentation of it."

It's interesting to note that, while much of the Human League material, and all of Alexander O'Neal's, was performed by male singers, historically the Jam/Lewis formula seems to work best with women: The SOS band, Cherrelle, Patti LaBelle, Cheryl Lynn and Janet Jackson all have fared well with the writing/production of the Flyte Time team.

"We write from a human perspective," Jam maintains, "but our biggest successes have come from writing for females. We really like female artists because we like melodies, and most female voices sing melodies much better than men's voices. There are a few cases where it's not true, but most of the time women got it."

With male or female artists, their

writing and producing formula seems to be working. At one time last year, they had *six* songs on the charts at once. And now they've found that one advantage of making the grade is they can be more choosy in the future.

"Right now we like doing whole albums," Jam says, "but when we first started out, it was a matter of trying to get as many things happening as we could. One of the questions we had to address was whether we were going to burn out because there's going to be so many Jam and Lewis things. There probably isn't ever going to be six on the Hot 100 again. There you had a situation with a Patti Austin album where we only did three songs, a Force MDs record where we only did one song. Now, by doing whole albums—the Human League, for example, was a three-month project—there's no way to have that much product out. So now, when we take on a project, we like to do the whole album. We like to have a full picture of what's happening. In the beginning, we did it because it gave us a chance to gain experience working with a lot of different artists in a lot of different situa-

—CONTINUED ON PAGE 103

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RIGHT TIGHT AUDIO

—FROM PAGE 101, JAM & LEWIS

tions. It worked out well for us.”

Of course, with an embarrassment of riches come missed opportunities. They were put in the position, for example, of turning down an offer to work on a song with Lionel Richie.

“We were in the middle of the Human League project when he called,” Jam says. “But the main [reason we didn’t do it] was, to us, there wasn’t a need to do it. I mean, one song was not going to sell a Lionel Richie album. Let’s say, hypothetically, that he was going for the black audience, and our song was the only song the black audience liked. They’re going to wait until it comes out on the 12-inch and buy it on the 12-inch. I would like to work with Lionel Richie, or any other artist, when there is a need to work with them, and when it’s not an afterthought—not when the album is done, ‘I’d better get one song.’”

Likewise winning the Grammy is a double-edge sword—while the little gold-plated statuette can be a boon to business, it can also be a great milestone around an artist’s neck.

“We put a lot of pressure on ourselves to do well,” Jam says, “but [the Grammy] just gives us something to uphold the standards of. Where people like Quincy Jones or David Foster have won, they’ve gone on to continue producing good records and be successful. That’s something we want to uphold. We don’t want, ten years from now, for people to say, ‘Yeah, Terry Lewis and Jimmy Jam were Producers of the Year, but they were just a fluke. They weren’t really legitimate.’”

“What happens is, your impact diminishes. At first you’re successful and it’s a big surprise and everybody’s happy. Then people *expect* you to be successful. You have a gold record and a gold record, and they say, ‘Oh, they’re *supposed* to do that.’ Then, if you don’t have one, it’s a negative thing, and they don’t remember that not everything you do is gold or platinum.”

If the past is a prologue, this is not something that Jam and Lewis have a great deal to worry about. ■

The NYC-based writer, editor and critic Hank Bordowitz cut his teeth in 8-track recording. He writes for almost everybody, from Mix to High Fidelity to Rockbill, and currently edits a new magazine called Rock Fever.

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THE ONLY EARS YOU'VE GOT

by Susan R. Hubler

Anatomy of the Ear

Packed into an egg-shaped chunk on each side of your head are the structures of hearing, balance, taste, saliva, smiling, frowning and crying, as well as two major blood vessels that supply the brain.

"Anatomically, there is more variety in the temporal bone than any other area of the body," explains Dr. Fred H. Linthicum, who specializes in the study of ears.

Inside this wedge of head is the smallest bone in the body—the stapes, or stirrup of the middle ear. Here, too, is the body's hardest bone, the otic capsule—a case that encloses the membranous labyrinth of the inner ear.

The membranous labyrinth contains cochlear membranes, vestibular membranes and fragile hair cells.

"All of these are exceedingly delicate," says Dr. Linthicum. "That may be why they are protected by the body's hardest bone."

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The ear canal is open to the outside world and therefore vulnerable to invasion and infection. It twists and turns—both to warn what lies ahead and to protect it. The skin is lined with hairs to stop airborne particles, and thousands of wax glands exude a natural glue to immobilize bacterial critters and fungi.

Ordinarily, the skin of the eardrum migrates outward, eventually to be shed along with the waxy lining of the ear canal. Left alone, the ear is self-cleansing and efforts to remove ear wax, or *cerumen*, merely push it farther in. Such self-help also tends to irritate the protective coating, thereby making it vulnerable to infection.

If wax does build up, it can cause itching, temporary hearing loss, or a sense of pressure. When there is absolutely no puncture in the eardrum, no sensitivity to touch or pain, no infection, you can try to loosen excess wax with drops of baby oil or a commercial preparation such as Debrox once or twice a day. After several cycles of this regimen, you may be able to flush out the softened wax with a bulb-type syringe.

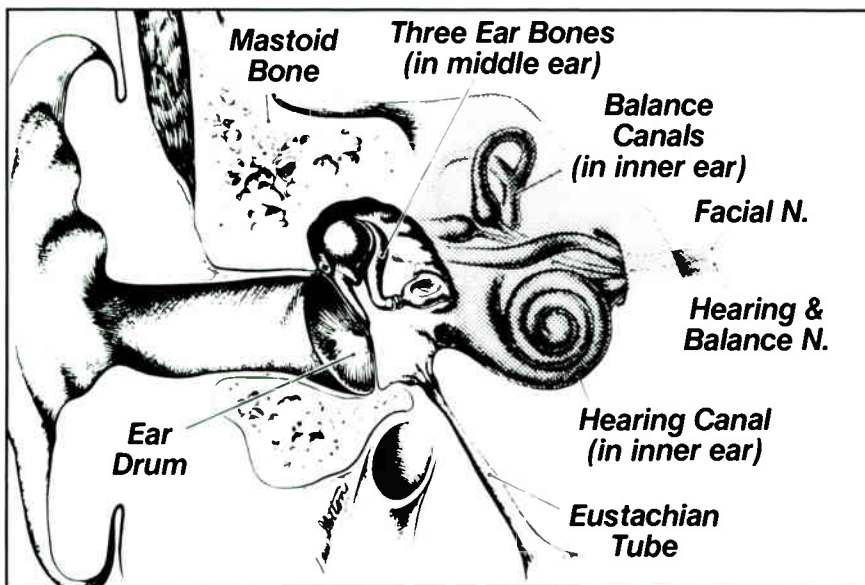
Moisture is usually a culprit in outer ear problems. When the weather is hot and humid, or when the ears don't fully dry after swimming or showering, bacteria multiply in the warm, dark dampness of the ear canal. The resulting *otitis externa* is widely known as Swimmer's Ear. Prevent it with a few drops of isopropyl alcohol or Swim Ear solution after swimming or showering.

A narrow or sharply curved ear canal, skin irritation, allergy, congestion, or chemical imbalance of the skin increases the risk of swimmer's ear. Symptoms range from mild itching to severe swelling, throbbing pain, fever and discharge. Stay out of the water and see a doctor. Otitis media can spread to the middle ear, the inner ear, the mastoid cavity and the brain.

Surfers and cold ocean swimmers frequently develop growths in the ear canal over time. These bony *exostoses* protude and deform the canal. They are surgically removed if they constrict the ear canal more than about 80%. Some evidence suggests that properly fitting ear plugs or ear putty shaped to the ear canal will protect against bony exostoses.

Gnats, moths, mosquitos, and roaches are most prone to find their way into the ear. Gnats get trapped in ear-

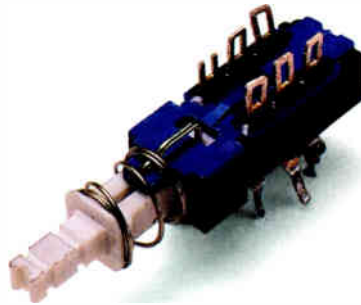
—CONTINUED ON PAGE 108



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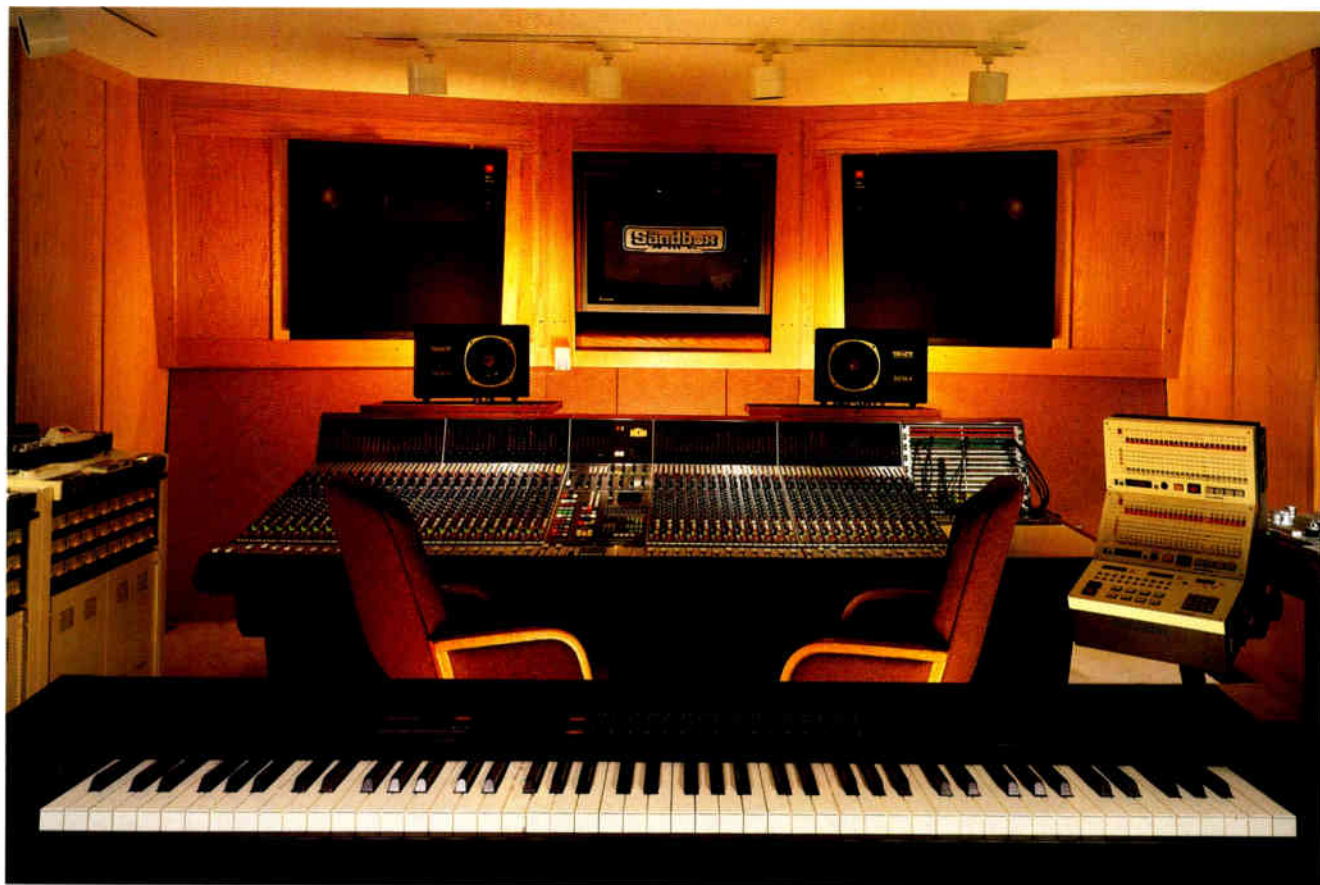
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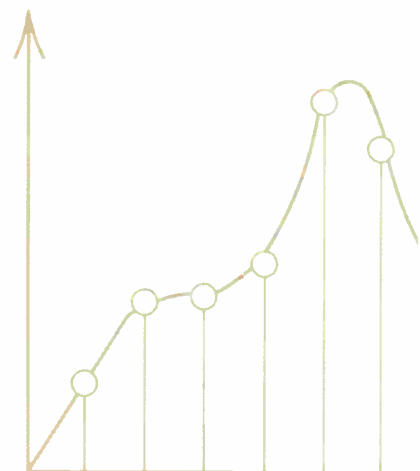
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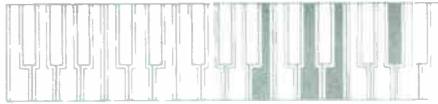
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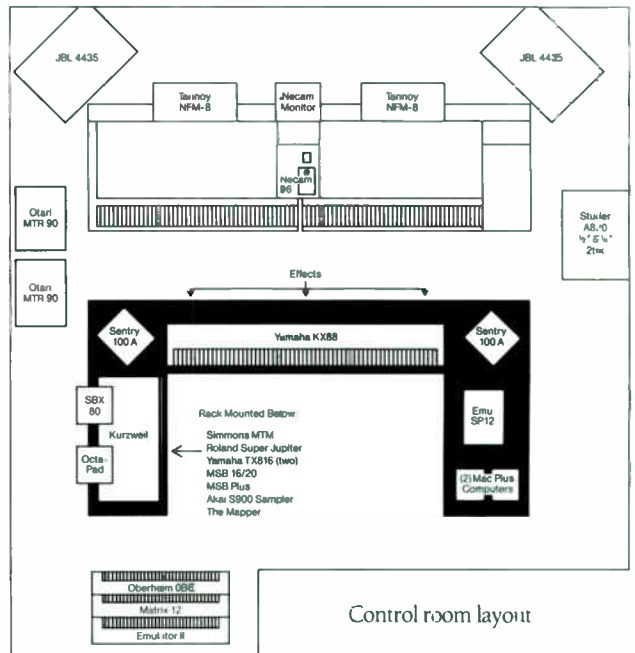
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—FROM PAGE 104, EARS

wax and wash out or fall out with the dried-up wax. Larger insects which can't turn around or crawl backwards can be drowned in mineral oil for five to ten minutes. If they don't slide out when you drain the ear, a physician can remove them.

Middle Ear: The Amplifier

The tiniest whisper across a room will set sound-bearing airwaves in motion. The diameter of an eardrum is less than that of your little fingernail, it will vibrate less than a hair's width, but you will hear that whisper. A lot happens first, however.

The moving column of air in the external ear canal pushes the eardrum against the first of three tiny bones on its other side: the *malleus*, *incus* and *stapes*. What we learned in grammar school to call the hammer conveys the eardrum's motion to the anvil, which passes it on to the stirrup. These three bones, or *ossicles*, comprising the middle ear amplify the mechanical energy of the vibrating eardrum as much as 20 times before the stapes, in turn, thumps against an oval window leading to the inner ear.

The middle ear is subject to viral and bacterial invaders through the eustachian tube, which opens to the

throat where microbes abound. Normally, this tube opens about every three minutes to equalize pressure between the body and the environment.

During air travel and other pressure changes, a healthy eustachian tube will open more often. The "pop" you feel when a plane gains altitude occurs because expanding air from the middle ear escapes through the eustachian tube. You can hurry the process along by pinching your nostrils shut and blowing through your nose, but *never* try this with a cold or fever! You will blow the germs right into your ears. Respiratory or ear infection and allergy can affect the body's pressure equalization process to produce severe pain at take-off and landing.

If you have to fly with sinus or nasal congestion (and you will do it willingly only the first time), take precautions. Take a decongestant such as Sudafed an hour before you leave and during the flight. Eat lightly and avoid alcohol. Chew gum and yawn a lot. One hour before landing and during landing, use a nasal decongestant spray.

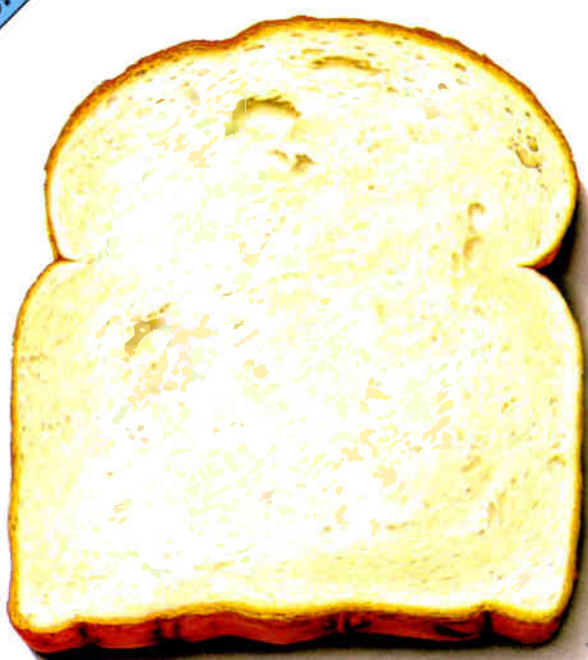
When all else fails, a kindly flight attendant may microwave a couple of dampened wash cloths in styrofoam cups for you to hold against your ears during landing. This may or may not ease your anguish, but the novelty of it may distract you for awhile.

Otitis media, the fluid-in-the-ear infection, is second only to colds in children's ailments, but most people outgrow susceptibility as their eustachian tubes lengthen and drain more efficiently. It is always serious because potential complications include mastoiditis, brain fever, or hearing loss.

Aside from infection, the main difficulty with the middle ear occurs when one or more of the three little ossicles undergoes a tissue change known as otosclerosis. Here, progressive deterioration—either hardening or softening—in the quality of middle ear bones influences their ability to process sound properly. They become fixed, cease to vibrate, and no longer conduct sound from the tympanum to the inner ear. The quantity of sound diminishes, though the quality may remain unchanged. This is known as *conductive* hearing loss. Conductive loss rarely exceeds 60 dB.

The bony changes and progressive hearing loss of otosclerosis can be controlled by medication if diagnosed soon enough. If not, the nonfunctioning stirrup can be cracked loose

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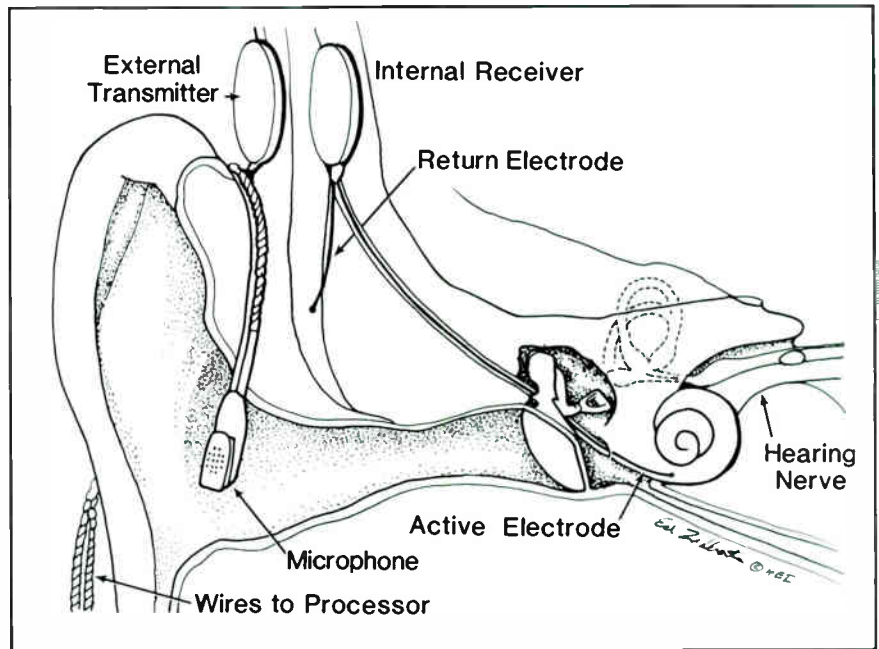
(stapes mobilization), or removed and replaced with a tiny steel prosthesis (stapedectomy). Hearing is usually restored in both instances. In fact, surgery is performed under local anesthesia and the patient hears again on the operating table.

Otosclerosis appears to be hereditary, so if one of your parents has it, be sure to inform your physician and be alert for signs of hearing loss.

Inner Ear: The Converter

Sound energy is converted to mechanical energy by the eardrum and stepped up by the middle ear. Acting as a piston, the stapes pushes against the round window of the inner ear and mechanical energy becomes hydraulic. It goes like this:

The *otic capsule*, or bony cavern of the inner ear is filled with fluid and contains the *cochlea*, a spiral-shaped tube also filled with fluid. Inside the cochlea are 15,000 to 25,000 microscopic hair cells. Their location along the cochlear curves appears to correlate with the frequencies to which they are tuned—they range from just a few cycles per second to 20 kHz.



Sound is scooped up by the shell of the outer ear, funneled into the ear canal where it pushes the eardrum and moves the malleus, incus and stapes of the middle ear. The stapes moves against another membrane which activates waves in the fluid-filled capsule of the inner ear and cochlea. Finally, electrical signals are sent along the hearing nerve to the brain.

Music & Health—Feeling Better

Music is a healer, a balm, an energizer, an answer to a lot of what ails us. Playing music is also a rewarding spiritual experience for serious musicians who sometimes forget about health in their quest of creating sounds. We musicians sometimes push too hard and then experience aches and pains that we have to deal with. I've experienced a lot of medical problems in my career as a studio musician, from arthritis and digestive problems to temporo-mandibular jaw joint syndrome (TMJ) and disk degeneration, that directly and indirectly resulted from my 10,000-plus recording dates. Through my own experiences, stories from other musicians, and consultations with doctors, chiropractors, osteopaths, neurologists, orthopedics, dentists, acupuncturists, reflexologists, iridologists, nutritionists and oral surgeons, I have gained valuable information on staying healthy and

fit. Following are some healthy ideas that you can use *now* to start on your path towards fitness and health. *If you have a serious problem, please consult a doctor, as this is not meant to take the place of proper medical treatment.*

A discomforting health problem or pain isn't always immediately noticeable or that acute. You can continue to perform while using drugs (legal or illegal) to hide the pain and temporarily alleviate the symptoms. But that will only disguise and postpone the problem. And the situation most likely will get worse. You'll have to deal with it eventually, so don't procrastinate! Martyrdom has gone out of style.

There are several methods of effectively dealing with aches and pains that result from playing your instrument: yoga-type breathing and relaxation exercises, posture corrections (adopting better posture habits, using posture aids,

etc.), finger and limb warm-ups before playing, and long neck, waist, arms and legs stretches after playing.

The neck usually is the first area to have problems from tension and pain. For relief, try rolling your head slowly in all directions while pressing your head against your hand as you tilt your head (isometrically) in all four directions. In those long body stretches, remember, don't bounce. Move slowly and hold each stretch for at least ten seconds.

After you've been sitting in the studio all day, moving your body is very important. I've found that a few simple shoulder rolls, especially backwards, can help relieve any subtle ligament, muscle or nerve damage build-up. Another good muscle exercise is to stand hunched over with your hands on your knees (like an umpire). Exhale all your air, pull in your stomach towards your backbone (don't inhale yet!), then press hard on each knee (alternating) for five to ten

—CONTINUED ON PAGE 110

Otosclerosis immobilizes a stapes, but a surgeon can break it off and replace it with a stainless steel wire that will still do the job.



Step 1:
Stapes Otosclerosis



Step 2:
Stapes removed



Step 3:
Wire replacing stapes

By physical-chemical means which are still mysterious, the cochlea is able to break music down into its constituent frequencies. Each frequency then excites a small segment of cochlear hair cells. Each stimulated hair cell sends an electrical signal to a nerve fiber, which then transmits it to the

brain where the signal is finally interpreted as music.

We start losing hair cells the minute we're born. They are fragile filaments, and do not regenerate when damaged. When they die, the frequencies they sensed are lost to us forever. The major threats to hair cells are in-

fection, drugs and noise.

A high fever, or one good blast of impulse noise can mow them down like hay before a scythe. The high-frequency sensors in the larger, open end of the cochlea are the first to go. Stubble may remain for awhile, but finally atrophies and is metabolized away, perhaps leaving behind a pesky ringing in the ears that can be matched to the frequency of the hearing loss.

Twenty-five centuries ago, the Greek city of Sybaris prohibited metal working within the city limits because the noise caused hearing loss. In Roman times, Pliny the Elder reported progressive deafness among people who lived near white water rapids on the Nile. Our auditory system will handle frequencies from 50 to 15,000 Hz competently. In a world of garbage disposals (80 dB at 3 ft.), chainsaws (108 dB), and jet planes, (140 dB at take-off), we can no longer cope.

Hearing damage due to prolonged noise exposure begins at 90 dB, though more sensitive people can sustain loss at 75 to 85 dB. To reach retirement as a hearing person, keep the decibels below 85 dB—about the intensity of an electric razor. Wear ear protection around diesel trucks, lawn mowers, power tools, guns, factory machinery and anything else that hurts or makes you irritable. Listening to live rock music more than two hours per day without protection can easily cause permanent, irreversible hearing loss.

—FROM PAGE 109, MUSIC & HEALTH

seconds. This strengthens vital organs, intestines and stomach. Fun stuff like the hula can strengthen the lower back (all right, let's see those tummy rolls!). And if you're looking for something a little more active to get the whole body pumping, walking fast (for an aerobic 30 minutes daily) is much better for your body than a joint-jamming run.

Pressing acupressure points, especially on the left side, until you feel relief (about two to five minutes) is also very good. Even if you're a Mr. or Ms. America type, be careful when lifting. *Always* bend your knees and use plenty of leverage.

If you're looking for a quick fix or some instant energy, the following nutritional and herbal aids provide short-term help:

—Cranberry juice and Perrier (bubbly water of any kind is fine, but I've found that Perrier works best for me).

—Clove or peppermint teas alone

or in black coffee (not much coffee for your daily consumption).

—Ginseng-Go-tu kola and vitamin B-12 combinations.

—A Lipo combo (choline-inositol-methionine-betain) occasionally after a heavy meal for easier digestion.

—Herbal allergy combinations, such as Golden Seal (comfrey, ginger, licorice root, cayenne, rosehips) and/or Paco D'Arco teas. Teas come in capsule or bulk form.

—Garlic pills.

These are harmless, general purpose aids that will naturally help your body to sustain health and equilibrium. If you indulge in "substances," eat greasy foods, load up on sweets, breads, gravies or heavy beef meals, you might want to consider a change of diet. Instead of ordering steak and potatoes, try substituting more vegetables, fruit and fish. Not only will you quickly notice the difference in your overall health, but you'll also notice an

—CONTINUED ON PAGE 113

—CONTINUED ON PAGE 114

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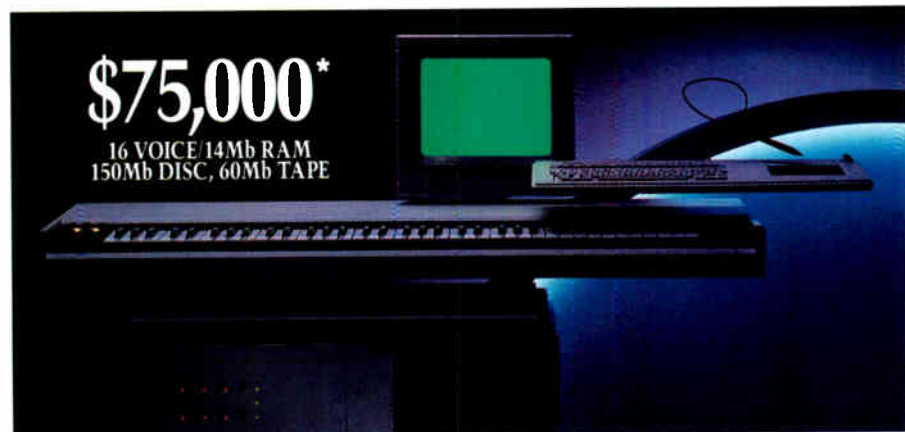
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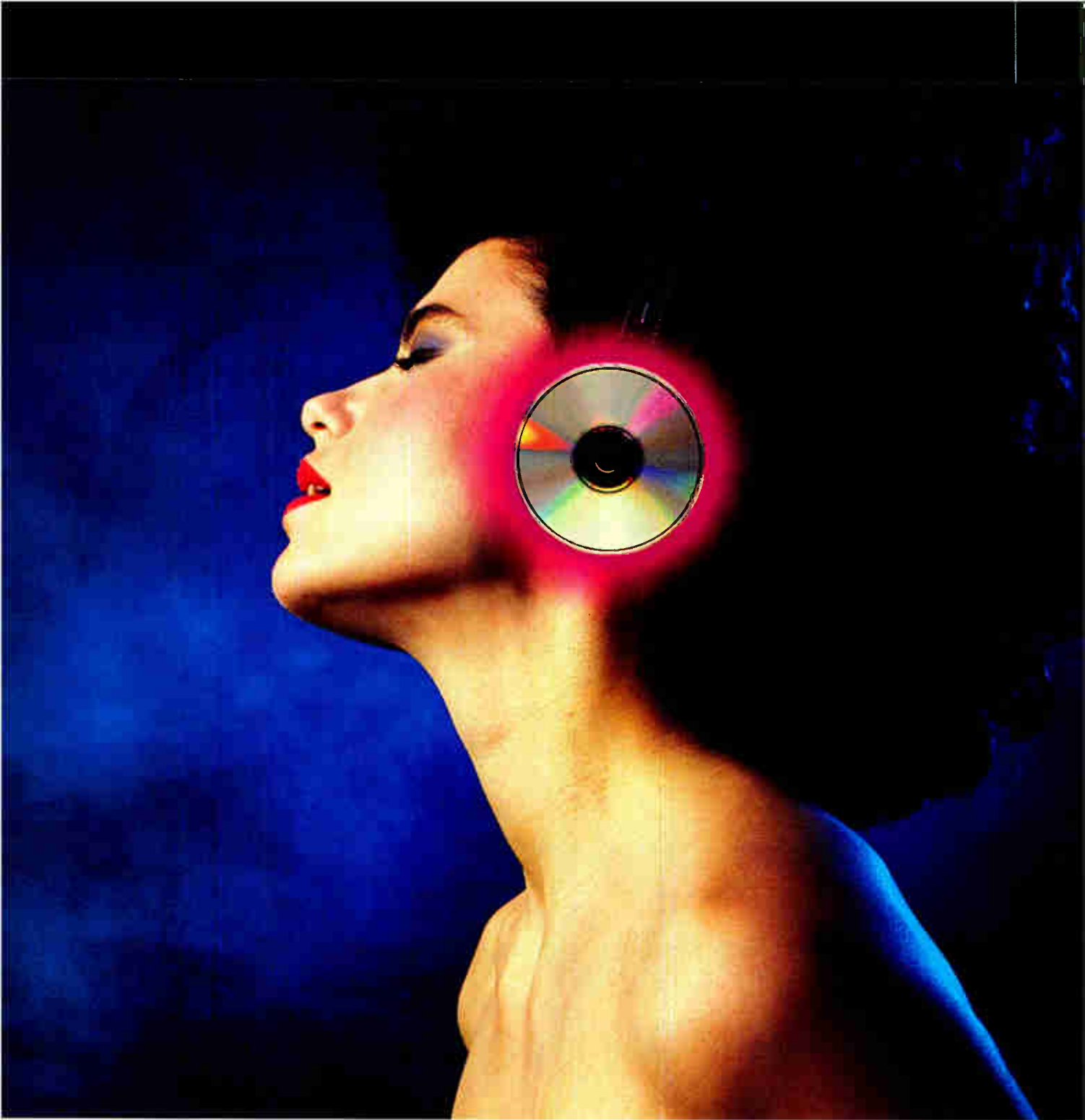
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—FROM PAGE 110, MUSIC & HEALTH

increase in your energy level.

A few other aids I've found useful are: Fenugreek herb tablets for sinus and mucus (peppermint tea works also); cranberry juice and juniper tea for kidney and bladder difficulties; eucalyptus oil and/or mullein oil for muscle rubs (external use only); tryptophane (an amino acid) for pain or a good night's sleep; rhubarb root herb capsules for occasional constipation; and biotin (a B vitamin) for calming and depression. Scullcap also helps those "downer" mood episodes.

Much has been said about bran as a needed fiber. Another good fiber option is popcorn. To add a little spice, try a sprinkling of parmesan cheese and maybe a little garlic in some melted margarine, instead of salt. To alleviate bad breath, try clove and mint teas or a bit of parsley. Comfrey and chamomile are also good for calming the digestive tract.

The jaw joint is the trickiest joint in your body. It moves up, down, forward and backward everytime you speak, chew or yawn. The jaw develops problems from abnormal posture, wear and tear, teeth grinding, bite problems, stress and even a bad diet. If you grind your teeth, you'll eventually develop an uneven bite or even lockjaw problems. If you hear "popping" or "clicking" when opening your mouth or chewing, have a ringing in your ears, along with pain in your neck, shoulder, ear and back aches and facial pain, chances are you have some sort of TMJ problem.

Dentists and doctors are just beginning to get a basic understanding of TMJ (temporo-mandibular jaw joint syndrome). This confusing and painful condition (I went to 200 doctors before I was diagnosed) seems to be prevalent among electric bassists and guitarists because of the stress resulting from the shape of the instrument. According to chiropractors, the vital vagus nerve system and trapezius muscles seem to be involved.

TMJ, a relatively new medical discovery, mimics a number of

health problems, including ear and eye problems, while symptoms like indigestion, abdominal and stomach spasms, mental confusion, coordination problems, dizziness, depression and cranial problems do occur with TMJ.

Acupuncture, while helpful in treating muscle spasms, does not realign teeth and related body structures—only a dentist and chiropractor jointly can do that.

A good dentist can balance your bite to relieve TMJ syndrome. Pressure is then relieved and the strain on the adjoining muscles, ligaments and nerves clears up. Not only will you feel better, but you'll have more energy and you'll be able to deal more effectively with everyday stress when your mouth is *balanced*.

Select your dentist and chiropractor (who is also needed to help correct the TMJ balance problem) carefully. The field is still highly experimental, so the most expensive doctor isn't necessarily the most knowledgeable. And remember, surgery is not always the solution. My surgery didn't work. (In fact, there is much controversy surrounding the benefits of surgery.) It's also wise to make sure that you don't have an underlying jawbone infection masked by TMJ problems. And if you have false teeth—don't worry, you can still be balanced and your problems relieved.

By all means, take steps to save your teeth now by flossing, and keeping your gums healthy by brushing the gum tissue (toward the teeth and in circular motions). I take ten to 12 grams of vitamin C crystal (good for the gums) every day with cranberry juice and a little aloe vera juice.

A few last tips: When traveling, V-8 juice is a great snack and lemon in water is not only a quick water purifier, but also aids the liver.

Take care of yourself! ■

Carol Kaye served for many years as one of L.A.'s most in-demand session bassists, with credits including The Supremes, the Beach Boys, Quincy Jones and Glen Campbell.

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—FROM PAGE 110, EARS

If you spend most of your day in a recording studio or in live sound situations, you can cut out as much as 30 dB of excess sound using inexpensive foam cushion ear plugs, such as those made by Cabot Corporation of Indianapolis. You can also juggle the amount of time you are exposed to potential hearing damage. The 85 dB level is the recommended maximum for people who listen for eight hours per day. Every time you cut your exposure time in half, you can increase loudness another 5 dB. In other words, if loudness is 90 dB, limit exposure time to four hours; if 95 dB, limit

exposure time to two hours; and listen to 100 dB one hour per day or less.

Inner-ear hearing loss is called *sensorineural*, or "nerve-type" loss. There are two forms of sensorineural deafness. Sensory loss occurs when damaged hair cells can no longer stimulate the auditory nerve. Neural loss occurs when actual fibers of the auditory nerve are dysfunctional.

When the loss is sensory, a new device called the cochlear implant may be helpful. Electrodes are implanted in the cochlea, where they stimulate the hearing nerve when activated by sound in the environment. At present, the cochlear implant sel-

dom permits speech recognition, but does allow profoundly deaf users to read lips more easily and recognize most environmental sounds.

Brain: The Central Processor

The most sensitive ears in the world merely collect and process data. It takes a central editor to collate and interpret the signals of sound. The auditory nerve carries these signals to the brain, which makes sense of the motion in air waves, membranes, bones, fluid and molecules. In some cases, the ears may work normally, but sound doesn't reach the brain because bleeding, blood clot, or a tumor on the nerve interferes with transmission of the electric signals from the ear. Brain injury or stroke can disrupt the mind's ability to interpret a sound stimulus properly.

Any central impairment is serious and should be monitored by a specialist in otology or neurology.

Music was David Pack's life. He went from Ambrosia to solo work and was recording "You're the Biggest Part of Me." Life was looking good. Then he woke up with a cold one morning and two days later all the hearing was gone from one ear. Panic, hopelessness, and defeat came first, but eventually gave way to determination. He learned to manipulate the headphone back and forth to alternate from voice to soundtrack, and now believes, "I get better use out of one ear than a lot of people get out of two."

Through the years that followed, Pack continued writing and producing. Recently, his original recording "Prove Me Wrong" from his *Anywhere You Go* album was featured in the movie *White Nights*. Pack is now producing from his own studio and just completed a tour with Michael McDonald.

Pack now contributes a great deal of his time and energy to the cause of hearing health. "Hearing damage adds up, and by the time you notice, it may be too late," he says. "Your ears are on call 24 hours a day. Take care of them; they're the only ones you'll ever have." ■

Susan Hubler, a behavioral scientist specializing in program design, is a medical writer at the House Ear Institute. A sufferer from "noise-induced hearing loss," she's interested in educating the public to the dangers of environmental noise.

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ing modules. Soon to be available is an electronic, programmable 2-way stereo crossover, with 24 dB per octave Linkwitz-Reilly phase-aligned circuitry, a built-in adjustable high-end limiter and balanced outputs. And more modules will be available in the near future to further help you streamline your system.

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(L to R): Ron Skies (chief synthesist and computer programmer), owner Spencer Taylor and Ron Bacchiocchi (chief engineer).

work inconspicuously. Thus, at no point would that become the focus of the session, because, after all, it's not. The focus is to make music and get the work done."

And Skies does virtually run the session as far as controlling the instruments. He changes routing, auditions, edits and loads sounds, documents the use of instruments and sounds, edits sequences when needed, fixes problems—all without leaving his chair. If an artist wants to use the Steinway (which has the Forte MIDI mod) or the drum pads, or an Octapad, or even buttons on a drum machine as a controller in lieu of the KX88, Skies enables the chosen controller at the touch of a button. In this case, the button he touches is on a Yamaha DX100 which sits at his station. The DX100's audio outputs are never used, it is used only as a system controller. Accessing different MIDI controllers and instruments is a common application for the DX100, which changes routing of the MIDI data by sending a program change command to the MSB 16/20. Repatching is never necessary. Another use for the DX100 is to edit or transpose part of a sequence

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from its keyboard.

Skies also can relieve the artist from having to deal with MIDI hassles. If an artist leaves a controller, such as a sustain pedal, engaged, Skies has a foot-switch at his workstation to turn the offender off. "The artist doesn't necessarily think in terms of how Note On and Note Off information works. If a sustain pedal sticks on, he may forget or not care—and he doesn't have to care. If something happens I don't say, 'Oh, don't do that,' I just take care of it. I don't tell the artist what to do or what not to do, because he doesn't want to know about it, plus it could make him uncomfortable or make him think about that instead of the music."

The purpose of the twin Macintoshes also is to keep options open at all times. With the heavy MIDI orientation, artists typically record to the computer before putting anything on tape. This fact, combined with Performer's multi-track recorder emulation, leads Skies to refer to Performer as his "MIDI recorder" as opposed to calling it a "sequencer."

Performances are only quantized or edited at the artist's request. But the desire of an artist to hear a new sound, for example, should not interfere with his/her ability to record at any time. This apparent conflict is resolved by dedicating one Macintosh (which we will call Mac A) to recording, leaving the other (Mac B) available for Skies to do whatever else needs to be done. "I always have things ready to go," he says. "Just like with a tape machine: when a client's in there, he expects it to be up and loaded with the tape. It's the same thing."

It also is necessary to avoid delays caused by waiting for a new application to boot up. Both Macs have 4 Mbytes of RAM and a hard disk (20 Mbytes on one and 74 Mbytes on the other), so Skies uses Switcher extensively to keep as many as seven or eight applications, one of which is Performer, immediately accessible on Mac B. If he needs to use more applications than can be held in Mac B, he saves the current Performer file from Mac A to disk and transfers it to

Sandbox Equipment List

Consoles

Neve V series console w/Necam 96, 24-input keyboard submixer

Tape storage systems

(2) Otari MTR-90s, Studer A820, (2) Revox B215 cassettes, Nakamichi DMP1000/Sony SL2001 Beta VCR

Monitors

JBL 4435, Tannoy NFM8, E-V Sentry 100, Visonik David 9000, Yamaha NS-10M

Outboard signal processing

Yamaha: REV7, SPX90, SPX90-2; Scholz R&D Rockman: Sustainer, Stereo Chorus/Delay; DeltaLab Effectron 2; (2) TubeTech EQ; Publison Infernal Machine 90 with MIDI; 22 sec/channel; UREI: (2) LA-3A, (2) 1176LN; Roland: (2) SDE3000 DDLs, SDE2500 MIDI DDL; Lexicon: (2) PCM70, Prime Time, 200, 224XL; Drawmer DS201 dual gate; dbx: 900 rack, (3) 903 c/1, 902 de-esser, (4) 904 gates, (2) 160 c/1; Audio Design and Recording: Panscan, Vocal Stresser; Aphex Systems Compellor; Korg SDD3000 DDL; Eventide 969 Harmonizer and 910 Harmonizer

Synchronization

Southworth Jam Box/4; Garfield Time Commander; Roland SBX-80; Adams-Smith 2600: LTC, parallel ifc, serial ifc; (2) Lynx TimeLine

(2) Macintosh Plus, 4 Mbytes RAM each; hard disks: AST 4000 (74 Mbyte), Apple HD20 (20 Mbyte)

Software (partial list)

Blank Software Drum File; Opcode Systems DX/TX Ed/Lib, Matrix 6 Lib, Matrix 12 Lib, OB8 Lib, MKS80 Lib, and D50 Lib; Kurzweil QLS; Digidesign: Sound Designer S900, FX Designer, Softsynth, Sound Designer Emulator II; Mark of the Unicorn: Performer, Professional Composer; Intelligent Music Upbeat

Controllers

7' Steinway Series B w/Forte MIDI mod; Yamaha: KX88, DX100 (not used as synth); Roland Octapad; set of Simmons and Pearl drum pads; Dyno-my-Piano with custom MSC MIDI mod

MIDI interfaces/processors

Simmons MTM, JL Cooper MSB 16/20, JL Cooper MIDI Blender, Axxess Mapper w/custom software by Brian Parsonnet

Samplers

E-mu: Emulator II w/Optical Media Systems CD-ROM, SP-12 Turbo; Akai S900; Kurzweil 250 expander (Publison Infernal Machine 90 with MIDI)

Synthesizers

Yamaha: (2) TX816; Oberheim: Matrix 12, OB-8 w/MIDI; Roland: MKS-80, D-50
Yamaha CD2000M CD player
Mitsubishi 35" hi-definition monitor



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Mac B, making Mac B the "sacred" recorder. Mac A, which generally holds additional applications in Switcher, is now free to perform the required task, and the artist is able to record again with a delay of no more than a minute or so.

The MIDI recording system is also one reason for the sheer quantity of instruments. With a large number of instruments, the client can amass many tracks of music before committing any of them to tape. It is not uncommon at the Sandbox for the multi-tracks to sit unused for hours at a time, in fact, mixes often are done directly from the MIDI recorder to 2-track without ever going

"I'm not partial to anything; I'm not a Yamaha man or a Macintosh man..."

to multi-track. Further, Skies can work with sounds on one instrument and the client will still have a plethora of others to use. Again, the emphasis is on instant gratification and not slowing the process to deal with the machines.

Of course, each instrument offers its own set of strengths and weaknesses and they are chosen and used accordingly. One TX816 rack, for example, may be used to make a single composite sound, while the other usually will be used multitimbrally. Intelligent Music's Upbeat program allows Skies to select and use the best drum sounds from different instruments. Device lists might be constructed that used, for example, toms from the SP-12, snares from the Akai S900, and Latin percussion from the Emulator II, all driven simultaneously from the set of Simmons and Pearl pads in the piano room. (The piano room and a vocal iso room both have MIDI patchbays to facilitate connection to the main MIDI system.)

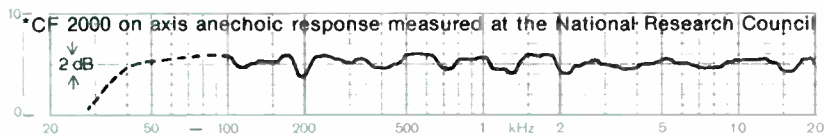
But Skies is ruthless in choosing equipment; a piece must be functional and not just the latest thing to find a home in the Sandbox. "I'm not partial to anything; I'm not a Yamaha man or a Macintosh man or anything else," he emphasizes. "As long as it does the job and can be used in a musical sense, it's fine with me—I don't really care. If something is a hassle to use, it ends up collecting dust. I don't use any of this stuff just for the sake of using it. There are many times where, almost to a fault, I'll let those 'technological opportunities' go by in order to let the best parts of the artist come forth, rather than saying, 'Hey, I could tweak that to death.' And sometimes I could truly enhance it, but..."

But it's not enough for Skies to have control over all the instruments, he also has to keep track of Sandbox's massive sound library, a major chore in a MIDI studio, just as in a film sound studio. Having a command of the sound library, asserts Skies, "is a matter of homework. It's a time-consuming thing to learn, and it's something you acquire over time. When it comes down to it, a sound is really indescribable. If you are going to be the person making the criteria (of what sounds will be used), the barometer person, there's no escape—you have to give some degree of direct aural attention to every sound that you have. Unless you do, there's really no way to know when that sound would be applicable and/or whether the sound is of good quality or even worthwhile. I could not give that job to anyone else, because how could they describe a sound to me?"

Once the music leaves Skies' domain, Ron Bach takes over in a similar vein,

—CONTINUED ON PAGE 170

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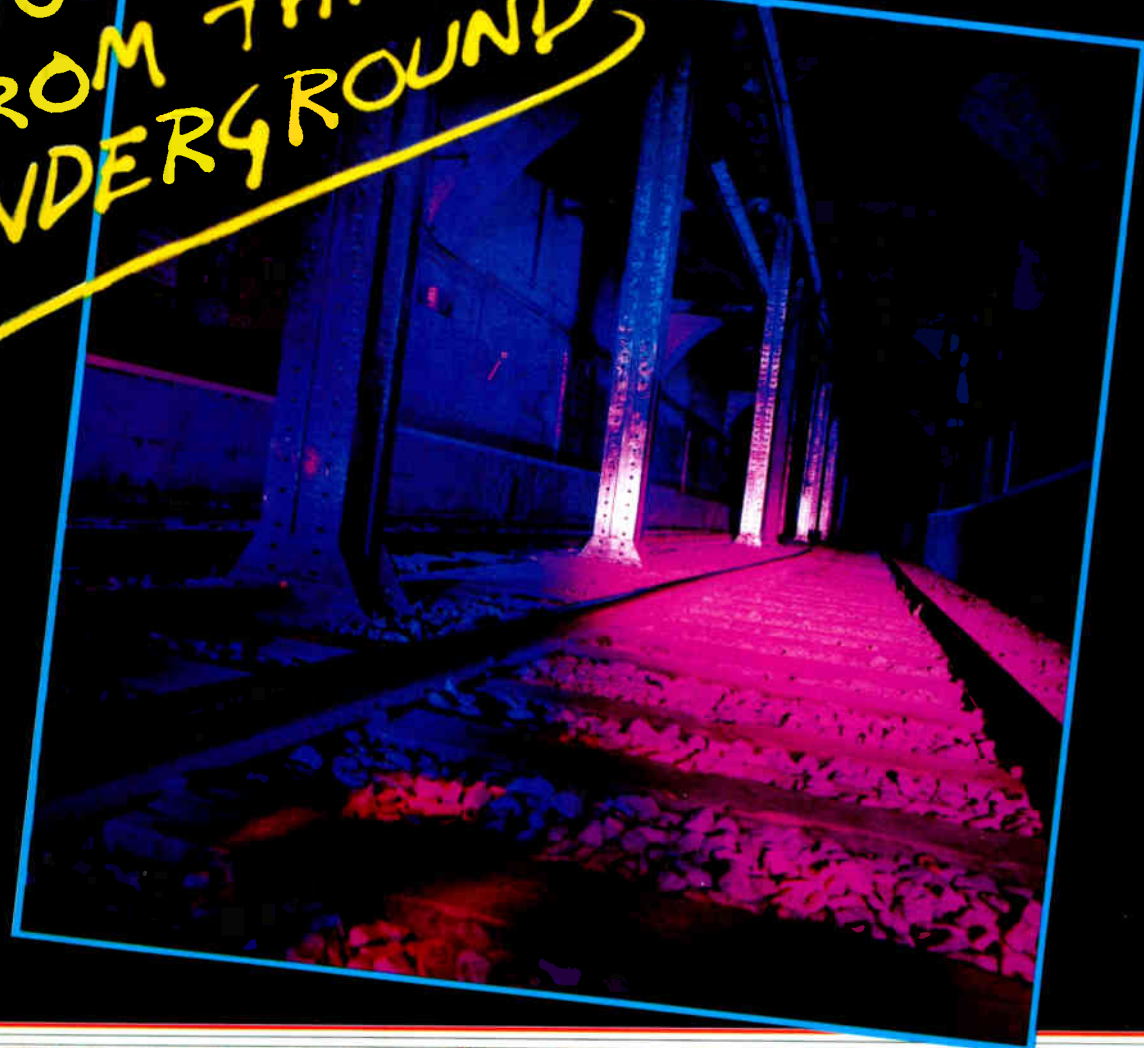
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NOTES FROM THE UNDERGROUND



NEW YORK'S HOT TUNNEL

Despite the fact—or perhaps because of it—that the cavernous Tunnel disco located beneath the desolate streets of Manhattan's West Side has no stage at all, it is nevertheless an appropriate subject for this issue of *Mix*. Sound reinforcement in clubs and discos (the latter a term that has been socially rehabilitated recently and is now politically correct again) has grown considerably more sophisticated over the last several years; not an unfathomable evolution considering that the technology that creates ever higher fidelity in music requires that the music's

by Dan Daley

reproduction systems keep up.

Tunnel is a linear version of a labyrinth, the club itself occupying 15,000 square feet of a 630-foot-long by 35-foot-wide subterranean catacomb. What Tunnel was, for the last nearly 60 years, was an anonymous, abandoned 25,000-square-foot hole in the ground. Before that it served as a railroad terminus for the West Side piers that bustled a century ago. Originally known as the Terminal Warehouse Company, the arched brick and mortar *demi-monde* was built in 1891 and provided sheltered space large enough to accommodate two sets of tracks for trains of the Baltimore & Ohio, the Lehigh Valley line and the New York Central Railroad, whose rotting trestles still traverse the nearby streets. A million square feet of storage space altogether, including the cavernous basements.

The Gophers and the Dead Rabbits, the Irish street gangs of Hell's Kitchen, used the area as free-fire zone in those days and it served as a backdrop to turn-of-the-century New York's own special brand of social Darwinism, with immigrant groups using the docks as a staging ground for a subsequent generation's climb to affluence and the American Dream.

From 1904 to 1915, the fledgling movie industry took up residence nearby in an old armory on West 26th Street. Mary Pickford and John Barrymore acted in flicks whose prints today are as rough and grainy as the cobblestones that still tenaciously poke through the asphalt-covered streets.

The neighborhood's renaissance is on, led by the nearby Jacob Javits Convention Center and trendy downtown development that creeps ever northward. The Dead Rabbits are gone, replaced by other, more subtly vicious varmints in three-piece suits whose limos line the narrow streets at night since Tunnel opened last December. The place's current status is the brainchild of Elli Dayan, the fashion entrepreneur who founded Bonjour International. That \$250 million garment business allowed him to move into real estate, Tunnel being the latest move. In a voraciously trendy city, Tunnel has managed to remain the pre-eminent disco in Manhattan since its opening ten months ago, no small feat in a local culture that devours and spits out monumental undertakings like some hip Godzilla with Eagle Snacks

airline peanuts.

History and *haute couture* aside, though, what sound system designer Robert Drake found upon his arrival at this narrow underground canyon was a potential sonic disaster. "I arrived here the same day another [sound system] contractor arrived—nearly a year and a half before it opened—and he was insisting on using diffusors," says the bearded former club DJ. "He wanted to diffuse the sound more than it would already be by the physical things in the room, like the supporting columns and steel beams. He wanted to use wooden diffusors, which would have made the sound even more difficult to control. My approach was to use absorption rather than diffusion. The owners thought they already had a handle on what they wanted to do with the room, sonically speaking. They had listened to the other guy first. So I volunteered a demonstration and brought in two small satellite speakers and two subwoofers and set them up using the close-proximity approach. I said to them, 'Stand right here and listen to it for a minute and then walk to the bar area and listen.' They immediately heard what I was talking about."

What Drake was referring to was the direct sound or near-field approach, an acoustic philosophy that uses sonic targeting rather than high decibels to fill the parts of the room that need it most. This approach has worked well for Drake over the years, including installations he has done at both the New York and Dallas Hard Rock Cafes, Tapis Rouge and Cafe Roma restaurants. Sonic treatment of the walls would have impaired the aged brick effect that was critical to the decor of the club, so Drake lobbied for what he felt was the only useful alternative to a room whose reverberation characteristics would turn any high dB sources into mush.

Dayan and company still required a bit more convincing, though, Drake recalls. "So I did a private party here for Elli before the club opened. They brought in a real big sound system, serious brute force. It was overkill as far as I was concerned, but that demonstration convinced him I could do it the way I said."

Drake got Howard Smith of the California-based Smith Fause Associates to crunch some mathematics for him. (Smith collaborated with Drake on the

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Hard Rock installations.) What Drake referred to as "a conflict of philosophies" continued with the architect and general contractor, George Schwartz and Jonathan Disick, respectively, until Dayan and his associates were once and for all convinced that Drake's approach was sound. The installation went ahead, budgeted at an estimated \$120,000.

Once the philosophy was agreed upon, Drake began choosing components to suit the room. Using SD cabinets made by Drake's company, RDA, three-way enclosures were spotted around the dance floor. The speakers are mounted on swing arms that allow

them to arc up to 18 inches from the wall, maximizing their directionality.

Drake also eschewed horns for the gig. "With horns you're asking for trouble in a situation like this," he says. "There's a long throw distance and a lot of information that's going to saturate the room faster and give you a lot less control. The owner wanted to concentrate the music on the dance floor and minimize spillout. Normally you would suspect that in any kind of a tunnel—a room like this—you'd have a big problem with reverberation and early reflections and the bounce getting to certain parts of the room before the original sound does, and that's ex-

actly the case. Based on that theory, I stayed away from horns because you only have about a distance of 25 feet from the speaker locations to the center of the dance floor."

On the 2,000-square-foot dance floor Drake employed two types of subwoofers, each crossed over at the same frequency—his SW cabinet and a smaller enclosure called an SX. The larger one is capable of an additional lower octave due to its 18-inch speaker and handles ranges down to about 38 cycles. "That's what gives you that great harmonic bass that really vibrates the room and gets people moving," says Drake. "But we have separate control over the two types." The DJ can cut either type of subwoofer out at any point, allowing him or her the ability to vary the dynamics of a record, thus providing an additional kind of control over the kind of character a DJ can bring to a room.

The DJ booth, located on a structural platform that houses a bar and serves as the bridge between the entrance and the dance floor, is a modified piano bar effect styled after European-type booths. Not surprising, since Drake did a six-year stint as a club DJ overseas.

"I use Rane MP 24 mixers on most of the disco installations that I do now," says Drake. "It uses slide pot faders which are cleaner and more effective than the rotary pots [which he refers to as "antiquated"] most of the other popular mixers for these applications use. I can't see the advantage of using a rotary pot. I had Jellybean Benitez in another club and he insisted that he wouldn't work there if he didn't have a UREI mixer with rotary pots. But I found that there was a marked difference in not only sound quality but in operation." Drake likes the ALPS faders in the Rane. "They feel good, they operate well, they're trouble-free and they're real faders" as opposed to sliders connected to rubber bands controlling rotary pots.

What he's looking for in the next generation of mixers are program sends and returns for each channel like the ones found on recording consoles. "What that enables you to do is send an effect from any one of your sources and not have it come back [as part of the mix]. When you're doing your mix, you can return the effect alone without the input source. That's a nice capability to have." Drake points out that DJs don't use signal process-

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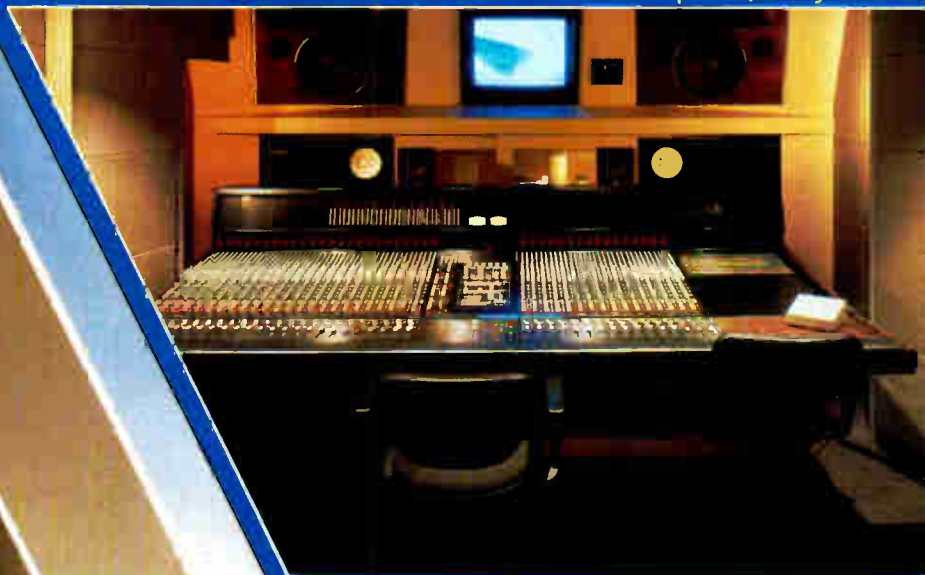
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by Linda Jacobson

AID & COMFORT

FOOD FOR THOUGHT

First (and briefly), the bad news: the AIDS epidemic continues to grow. The "good" news is that there's widely spreading acknowledgement that private funds must be raised to fight AIDS. This led 14 top San Francisco Bay Area restaurants to throw together "Aid & Comfort," an AIDS fundraiser of epic proportions and spirit, held

this summer on a dock by the Bay.

The restaurants and their staffs donated food and time. California's best vineyards donated wine and champagne. The nine-course gourmet feast was served in Pier 3 at San Francisco's Fort Mason by over 500 waiters and waitresses. Talent donations came from entertainers as varied and stellar as the meal, including Linda Ronstadt, Shirley MacLaine, the San Francisco Ballet Orchestra, Bobby McFerrin, SF restaurant owner Boz Scaggs (his first local performance in years), Carlos Santana and many more.

Over 1,000 people each paid \$250 to wine and dine. For \$175 apiece, 500

Sound designer Roger Gans (below) at work during the Aid & Comfort live broadcast.

Shirley MacLaine asks the well-fed audience, "May I say this is the best dinner I've had in over 4,000 years?"



PHOTOGRAPHS BY LINDA JACOBSON

by Mark Herman

ON THE ROAD

SOUND COMPANIES, EQUIPMENT, ARTISTS & PERSONNEL ON TOUR

Artist Sound Company Tour Dates Region	House Console Monitor Console	Crossovers Main Speakers Subwoofer Main Amplifiers	Monitor Speakers Monitor Amplifiers	House Mixer Monitor Mixer System Engineers
Bryan Adams Jason Sound Industries May-Sept U.S. Oct-Dec Europe	Soundcraft Series 2400 32 w/10 ch extender Soundcraft Series 800 32x10	BSS/JSI 54 JSI J-60 12 JSI J-1 Carver	JSI J-7, J-14 Carver	Jody Perpick Glenn Collett Jim Stanforth, Bill Philput
The Bangles Audio Support June-July U.S.	Midas Pro 40 32 ch TAC Scorpion 40x12	Meyer 24 Meyer MSL3 12 Meyer 650 Crest	Audible/Compact Crest	Steve Botting Andy Chapel Anthony Stabile, Henry Cohen
Boston Showco May-Oct U.S.	Harrison HM-5 32x16 w/16 ch extender Harrison SM-5 32x16	Showco 80 Prism™ Sound System 12 Prism Subwoofer Crown	Showco 100, 200, 300, 400 Crown	M.L. Prociase J.W. Roberts Mark Hergenrader, Dan Huffman, Leon Hopkins
Grateful Dead Ultra Sound June-Oct U.S.	Gamble HC 40x16 Gamble SC 40x16 + Yamaha PM1800 32 ch	Meyer 64 Meyer MSL3 18 Meyer 650 Crest	Meyer Crest	Dan Healy Harry Perpick Don Pearson, Mike Brady, Bernie Granat, Chub Carrier
Whitney Houston Maryland Sound Industries July-Dec U.S.	2 Harrison Alive 32x4 Yamaha PM2000 32 ch	MSI HSX 301 60 MSI HI Pac Low Pac Crest, SAE	MSI Custom Crest, SAE	Steve Guest Bill Wynn Dave Callahan
Billy Idol Electrotec Productions July-Aug U.S.-Australia	Soundcraft Series 4 40x16 Soundcraft Series 4 40x16	BSS 76 Electrotec Lab-Q 8 Electrotec Lab-Q low bass Crown, UREI	Electrotec Floor JBL, UREI	Robert "Dansir" McCulloch George Barnes Bill Chryser
Billy Joel Audio Analysts Sept '86-Dec '87 International	Soundcraft Series 3 40x16 + Soundcraft 800B Soundcraft Series 4 40x16	BSS 60 Audio Analysts Arena Phase Linear	Audio Analysts Custom QSC	Brian Ruggles Michael "Hoss" Klefer Mario Leccese, Russell Lynn
Huey Lewis & The News Sound on Stage Aug '86-Sept '87 U.S., Japan, Europe	Gamble Series EX 56x30 Gamble SC 32x16	SOS 24 Power Physics 842 Crest	Power Physics Custom Wedges Crest	Mark Deadman Jim Moran John "JT" Taylor, Roger Rif- kind, Bob Goodwin, Ricardo Caltagirone
Madonna Clair Brothers June Japan, June-Aug U.S., Aug-Sept Europe	2 Clair 32x8 Harrison SM-5 32x16	Clair 120 Clair S-4 Carver	Clair LP112, LP115 SAE	Dave Kob Randy Weitzel Rex Ray, Steve Helm, Tom Ford, Forrest Green
Motley Crue Tasco June-Oct U.S.	Midas Pro5 40 + Midas Pro5 32 Soundcraft Series 4 40x16	SG Engineering 108 Harwell Crown	Tasco Wedges Crown	Larry Quigley Brian Hendry Arthur Kemish
U2 Clair Brothers April-May U.S., June-Aug Eu- rope, Sept-Dec Japan & Aust.	2 Clair 32x8 Harrison SM-5 32x16	Clair/Electro-Voice 144 Clair S-4 24 Clair Sub-low Carver	Clair Custom Carver	Joe O'Hertlihy Dave Wilkerson Jo Ravifeh, Dave Skaff, Chris Patterson, Bill Louthe

SOUND · ON · STAGE

of them snapped up commemorative art/recipe portfolios. San Francisco's public TV station KQED broadcast part of the event live, in telethon mode. Thus, over half a million dollars were gathered and given directly to five AIDS-related organizations in the Bay Area.

Substantial corporate donations, along with \$20,000 from the Grateful Dead's Rex Foundation, helped pull off the meal. That was enough to turn Pier 3 into a gastronomical pleasure palace, but not enough to transform the cavernous, steel-and-glass structure into an acoustical environment suitable for speeches, video clips, and live music. The need for full band-

width audio reinforcement for the highly publicized, well attended, star-studded TV show was compounded by the *type* of audio—classical and acoustic music need a reinforcement system as transparent as possible.

After three days of pre-production, the sound crew created a system with wide, even dispersion. Their controlled, coherent coverage of the live, crowded area contributed to the overwhelming success of Aid & Comfort.

This all started when the co-owner of a popular SF cafe lost five friends in one month to AIDS. He decided to do something about it. His idea for a sit-down dinner/fundraiser appealed to the restaurant community (hard-hit by the epidemic) and 13 other restaurant

owners joined the effort. So did various entertainment producers, including rock impresario Bill Graham and director/choreographer Michael Smuin. Smuin approached the SF Opera Association for help with the event's sound reinforcement. That's when operatic and theatrical sound designer Roger Gans—the Opera's engineer for the past decade—took over as Aid & Comfort's sound designer.

Gans designed a system similar to the one he uses on tour with Luciano Pavarotti, which he developed with engineer/designer Drew Serb. Serb runs Pro Media, a San Francisco sound reinforcement company and system supplier/installer (which primarily serves corporate clients, but also travels around the world to handle sound for everyone from Pavarotti to the Pope). Pro Media donated the system hardware and staff to Aid & Comfort. Another Bay Area sound company, Sound on Stage, volunteered stage monitors and staff for the rock and roll sets. Gans also brought in freelance audio/video engineer Alexander "Thomy" Yuill-Thornton II for his Precision Room Equalization (PREq)[™] (a technique with foundations in John Meyer's Source Independent Measurement). Gans, Yuill-Thornton, Pro Media sound engineer Lori Bolender and their 19-member crew set up a system based on their unusual methods and gear.

When A&C was in full swing, the long, narrow, rectangular hall held 1,040 diners, served at 115 large round tables. The orchestra played on. Hundreds of servers hustled trays of delicacies. When one dumped his tray of gooey dessert in front of the stage, the first who jumped to clear the mess was ex-waiter Bill Graham (an incident indicating the spirit of the entire evening; those eating *and* working smiled all night).

The 80 foot-wide, 42 inch-high stage was built along the middle of one long wall. Flying 21 feet above it were three wide-throw, point-source Meyer Sound speaker clusters each holding four bi-amped MSL3s (a high-power arrayable system) and four biamped UPAs (a more compact, high-power two-way system). The clusters tilted downwards to help control reflections off the close opposite wall. The center cluster held an extra backfill UPA, the only stage monitor until Sound on Stage set up the rock and roll show. Beneath the stage were four Serb-de-



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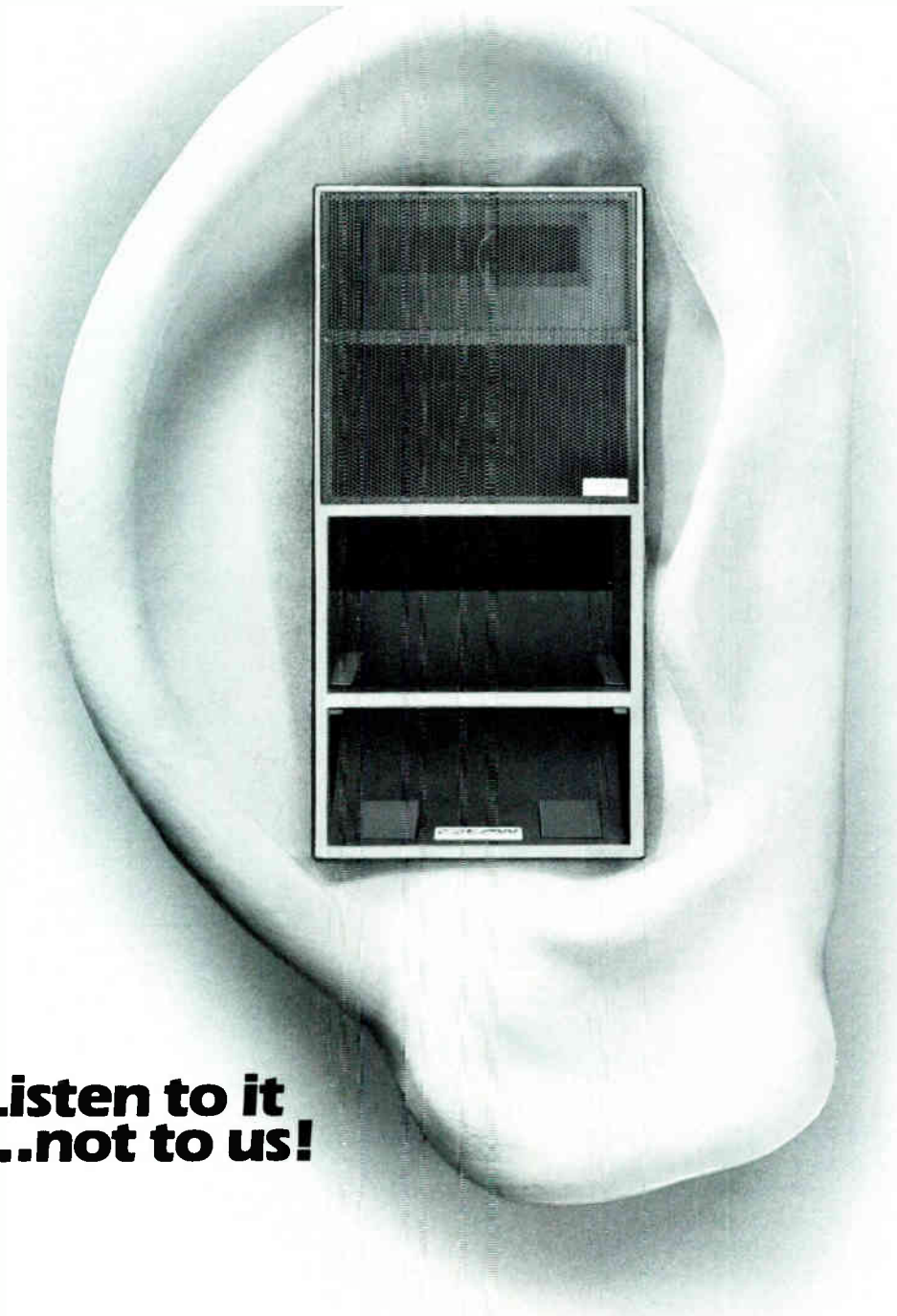
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SOUND

REINFORCEMENT NEWS

Andrews Audio Tours of NY, NY provided equipment support for **The Cure** and **Grateful Dead/Dylan** tours. For The Cure, a complete Meyer monitor system was provided. Twenty-four Meyer cabinets powered by Crown MT-1200LX amplifiers augmented Ultra Sound's main PA for the Dead/Dylan tour. . . A TAC Scorpion 30/12 monitor console was also provided for Ultra Sound's **Hipsway** May-June tour. According to owner David Andrews, "I believe we are the first company to purchase the new Crown Macrotech 2400. We just received six of them." Andrews also is an equipment supplier for television—they recently sold **NBC** the monitor system for the popular *Late Night with David Letterman* show. . . **Mike Sinclair**, formerly of See Factor, is now actively working with Andrews Audio. . . For everybody attending the **October AES** show in New York, you should be aware that they are, as in past years, responsible for all the sound equipment used for the various seminars and workshops. Remember, these guys are working while the rest of us are conventioning.

Rock in Russia? Again? You bet. Following in the footsteps of Bill Graham's successful July rock for peace concert in Moscow with Santana and the Doobie Brothers, **Audio Analysts** supplied the first large scale American-type sound system ever employed in the Soviet Union for the **Billy Joel** tour. After several shows in the UK, the equipment was flown to Russia to do three dates at the **Olympic Stadium** in Moscow and three more at the **Lenin Sports Complex** in downtown Leningrad. The stage featured monitors placed underneath the stage for clean sightlines. Billy Joel has been touring since September '86 and plans a short break after the Soviet Union shows before continuing the international tour. . . Audio Analysts is keeping busy supplying

systems for **Roger Waters, Heart, Run-DMC** and **Freddy Jackson**. The Roger Waters tour uses five separate PA clusters running off a special custom quad console with quad pan pots designed by **Albert Leccese** head engineer for AA. The quad console is fed by a Soundcraft Series 4 and a Yamaha PM3000, while the monitor system also features two consoles, a Gamble SC and a Soundcraft Series 4. . . Gamble consoles are also being used on the Run-DMC and Freddy Jackson tours.

From Canada, **CADD** (Creative Audio Design + Development Inc.) located in Brossard, Quebec, is pleased to announce that their programmable digital crossover for sound reinforcement is now being manufactured and will be used on several of **Audio Analysts'** fall tours. The unit features 16 programmable crossover points, built-in delay line, digital limiter, and is designed for any pro sound system. On the mixing console front, **Shane Morris** is heading the development of house and monitor consoles that should be ready for release in late '87 or early '88.

Up in the great Northwest, Canadian-based **Jason Sound Industries** is building another custom touring system to match their new **J-60** system currently out with fellow Canadian **Bryan Adams**. After the North American leg ends on the East Coast in mid-September, they plan to ship a slightly smaller version to Europe to complete Adams' 1987 tour schedule. Upcoming touring in '88 includes Canada, Australia and Japan. . . The second J-60 system, featuring custom designed 5-way horn-loaded cabinets with JBL components, is for another Canadian-based act, **Loverboy**. The J-60 system actually is composed of three boxes. The J-63, a 3-way high and midrange enclosure, and the J-62, a low frequency enclosure, are

—CONTINUED ON PAGE 136

signed sub-woofers, dual 18-inch Altec cabinets, loaded with JBL 2245s. Two more UPAs provided sound to people milling at the "cocktail" end of the hall.

Along with 12 Sennheiser MK4s, four AKG 451s, and four handheld Shure SM85s, Pro Media supplied six custom Shoeps BLM-3 "plate mics," hung from trusses over the 60-piece orchestra. Gans notes, "70 to 90 percent of the sound in the place was from on stage. There wasn't all that much going through the sound system. That system was set up mainly for coverage.

"We developed the specialized arrays and mic plates," continues Gans, "between working with Pavarotti and the Opera company. We developed our techniques and this particular system for classical music, but I think the mic plates would be good for any kind of music played in an acoustic ensemble setup."

Gans explains, "In the middle of a 40-inch plate is a Schoeps Boundary Layer Mic [BLM], which is somewhat like a [Crown] PZM™ except it has a quality condenser element for better frequency response. The plate lets us suspend the mic, but it also creates a larger boundary for improved response, and it provides rejection from the rear end from the speakers, like a cardioid mic would. We angle the plates when we hang them so that they provide as much direct rejection to the loudspeakers as possible. The BLM has a hemispherical pattern; if it were hung in space, it would almost be omnidirectional, which is why you can't use it in a sound system without some sort of rejection. Otherwise you wouldn't have any gain.

"The main goal is for the different orchestra sections to be able to blend before they get picked up and put in the sound system, so the conductor has a better chance of balancing the orchestra. The hemispherical pickup means the off-axis response is pretty smooth. A trumpet in the back of the orchestra that leads into the microphone doesn't sound really ragged, and because of the mic's proximity to the weaker instruments, there's more of a blend."

Gans sets up the stand-mounted AKG 451 and Sennheiser MK4 mics to sweeten the basses, percussion and harp. He likens his technique to "a

cross between sectional miking and what a recording engineer would do in a space with maybe two or three omni mics in the sweet spot, so the conductor is the one who controls the orchestra, not the guy who's mixing."

When the Schoeps BLM came out, Gans and Serb experimented with bolting it onto plates of different sizes and materials. At first cut in a square shape, the plate's corners were sliced off for cosmetic and safety reasons. The 40-inch diameter, notes Gans, is "a compromise, because anything larger would be too unwieldy. Ideally, the plate would be six feet across to get full frequency response." He adds that the plates, usually mounted on 8-foot stands, cause some controversy: "Wherever we go, we have trouble with them visually. The video people always complain, even though the plates are made of frosted Lexan so they don't reflect much light. At Aid & Comfort, though, people liked them, whereas at classical music concerts, they complain, 'what are those things?' They're just not consistent with what is normally seen on a classical music stage."

Out of sight from the audience, Yuill-



Thoray Yuill-Thornton calls up some room curves on a PC for his Precision Room EQ process, the day before Aid & Comfort took place.

Thornton's PREq techniques gave a handle on room response, using Fast Fourier Transform (FFT) analysis to calculate the effects of electronics upon acoustics. At the heart of his system

is his own interface/switcher which hooks up with a Hewlett Packard PC, an HP 3582A spectrum analyzer, and six Meyer Sound CP-10 parametric EQs.

Yuill-Thornton uses this system to continually make measurements, comparing reference signals with "unknown" variables, then uses the CP-10s to correct the room's amplitude and phase effects, then makes *more* measurements to confirm the results of the room EQ. Since Pier 3 was not treated acoustically, there wasn't anything that could compensate for the inevitable reflections and echoes. Yet, using the PREq techniques, Yuill-Thornton worked his way around that. As he puts it, "I don't care what the EQ is; just that the system is flat when I'm done. This PREq process is pretty young, but I think it contributes substantially to sound quality during the show."

PREq is based upon the ability to measure and compare two time-coincident signals. Yuill-Thornton checks and compensates for differences in frequency response between them. One measurement pits amplifier input ("the naked room") as the reference against a room mic as the unknown. He also

—CONTINUED ON PAGE 136

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—FROM PAGE 134, NEWS

both designed to fly. The third box is the dual 18-inch J-1 sub-woofer that remains on the floor.

Southern California's **Electrotec Productions Inc.** always seems to keep busy and this season was no exception. Explains **Pierre D'Astugues**, "We have been very busy doing the **Psychedelic Furs**, **Tom Petty & the Heartbreakers**, **Billy Idol** and **Air Supply**, in addition to the sound and lighting for **Alabama**. In Europe we're doing **Def Leppard**, and a lot of outdoor stadium shows with **Spandau Ballet**. The Def Leppard show is a very interesting situation with a heavy rock band going in the round. **Yes** did it a long time ago, but this will be the first time for a band of this type." The **Billy Idol** tour features flying sidefills and overhead monitors. Electrotec is also slated to do **Bob Dylan/Tom Petty** and **Alice Cooper** in Europe.

Hurrah!! The buzz that has haunted engineers for at least seven years

on the right side of the house PA at the **Greek Theater** in Los Angeles is finally gone! Hats off to **Jim Gamble** who, dropping in before an Oingo Boingo concert, decided enough was enough and proceeded to eliminate the troublesome noise.

Pink Floyd is out with **Maryland Sound Industries** using 130 MSI Hi Pak/Lo Pak boxes along with an additional 80 quad boxes to augment the special quad mix. . . **Patti LaBelle** and hot selling **Whitney Houston** continue to remain strong touring clients through the summer and fall. Other MSI acts include **Crosby, Stills & Nash**, **Anita Baker**, **Luther Vandross**, **Dan Fogelberg**, **Frankie Valli**, **The Cure**, **Roberta Flack**, **Peter Allen** and **Kenny G**.

On the rise. . . **F & M Sound Productions** out of Memphis, Tennessee recently hired sound reinforcement veteran **Tim Lawrence** as chief engineer. In a move to upgrade into the touring market, owner **Scott Fuelling** purchased a 52 box main, 10 sub,

house PA from **Z Systems** out of Miami. The all-Gauss loaded system is powered by Phase Linear amplifiers. Lawrence says, "I've used this same PA system before and I know what it can do. That's why we bought it. This PA was originally the Cameron system out with ZZ Top years ago and it still sound great. We're aiming for a strong regional act that needs total production; sound, lights and trucking."

Sound reinforcement for **Pope John Paul's** September 17 visit to Candlestick Park stadium and St. Mary's Cathedral in San Francisco was provided by **Pro Media**. At the stadium, Meyer MSL 10s were used for the point source and MSL3s for sidefills. . . An August 30 concert in Buenos Aires, Argentina with opera star **Pavarotti** was also on their agenda. . . Pro Media has recently provided stadium PAs for **Stanford University** in Palo Alto, and the **Rose Bowl** in Pasadena. . . At Stern Grove in SF, the Opera, Symphony, Ballet and others all benefited from Pro Media's clean

—FROM PAGE 135, AID

measures the results of EQ'ing, which "tell me how good I've done my job;" comparing the input of the EQs and the "unknown" mic input lets Yuill-Thornton see the effects people, tables, and temperature have upon room acoustics.

The computer stores room curves so Yuill-Thornton can recall them on the 'scope and adjust the EQ to match specific curves. The interface/switcher takes a minimum setup of three mics, and provides gain controls, headphone preamp and switch, switch matrix to select measurement mode, mic input(s), and line input(s), and an IEEE 488 interface for the PC.

Two of the six Meyer EQs are used on one of the speaker clusters, selected as the "master" system. "I establish it as a known system and bring up each slave system [which each have two CP-10s] and manipulate the slave so it fits in with the master.

"The key to the whole concept is the CP-10's complementary filter, which was designed for this kind of use. It cancels out one filter with another. Often, room resonances appear very similar to the CP-10 filters in equalizing; so if you set a filter for the *complement* of the room resonance, you can compensate for both amplitude

and phase effects of the room resonance. I identify the resonances and then set the filters."

Gans remarks, "we need PREQ because room acoustics are always changing and different resonances develop, and especially because our system is not high gain; its low end is very close to the edge. The more tuned it is, the more stable it is." He adds that the technique doesn't apply to all kinds of music; it wasn't used during the rock and roll sets, "because there was too much sound coming off the stage that was not in the sound system; you can't make measurements because they're contaminated by extraneous noise. The PREQ system cannot discriminate between an amplified system and live sound, so you can't tune them."

Gans mixed the acoustic performances, including the Orchestra, Linda Ronstadt, Bobby McFerrin and Shirley MacLaine at a 40-channel Yamaha PM3000 console. So that no one would have to repatch cables for the rock music sets, a Yamaha PM2000 console was set up next to the larger board, and run by the bands' engineers. Ronstadt delivered the poignant "Desperado," and Bobby McFerrin stopped the show with his 10-minute performance of *The Wizard of Oz*, complete with all tunes, famous lines, and audience

participation. When Boz Scaggs and his band performed, samba lines of servers and tuxedo-clad diners sashayed through the tables. The event's emotional peak came when the Chanticleers were joined on stage by 500 swaying, clapping staff volunteers for an a capella rendition of "Lean On Me." Even the walls had goosebumps.

Aid & Comfort marked a first for the food community and industry. Aside from raising money, the event carried symbolic weight—only a couple of years ago, until people learned that AIDS can not be spread by casual contact, some feared that it might be spread through food, particularly at restaurants with gay employees. The exuberance and community concern experienced by all who took part in Aid & Comfort—especially those who made it possible—will be felt until someone finds a concrete way to fight AIDS. As Shirley MacLaine put it, "this event should ripple across the world as an example." ■

When technical writer and Mix assistant editor Linda Jacobson goes out to eat in San Francisco, she usually seeks Thai cuisine, a Tex-Mex meal, or vegetarian enchiladas—items not readily available in her hometown Rockaway Beach, NY.

sound in an 11-part series of jam-packed free concerts for the public.

Phoenix-based **Stage Sound Inc.** installed a permanent summer lawn sound system for the **Starwood Amphitheater** in Nashville, TN. "With 18 Meyer MSL3s and six 650 subs we can handle just about any act that comes through," says **Rob Pierce** of Stage Sound. "We're also doing commercial shows and the **Colorado State Fair** with some of our other equipment. When the Pope comes to **Arizona State University Sun Devil Stadium** we will be providing equipment for that as well. For the fair we'll be using two Midas monitor boards, our new Gamble EX 56-channel house console and a Yamaha PM3000 40-channel." Some of the acts headlining for fair include **Stevie Ray Vaughan, Charlie Daniels, Greg Allman, the Beach Boys, Charlie Pride** and the **Everly Brothers**.

My personal nomination for this past summer's best show goes to **Oingo Boingo** July 18 at the Greek Theater in Berkeley, CA. Great mix and a great band. Sound reinforcement for this date and the rest of the July tour was provided by **Schubert Systems Group** of Gardena, CA. **Peter Varco** was responsible for the excellent house mix while **Kevin Korecky** handled the onstage monitor chores. Assisting engineers were **Gary Whitelock** and **Don Barron**.

English equipment manufacturers **Martin Audio** and **Midas Audio Systems** recently announced they have merged. Last year Martin Audio bought a 10,000 sq. foot building outside of London to keep up the demand generated by a 40% yearly increase in sales. The new company is parent to **Martin America** located in Chatsworth, CA.

Texas-based **Showco** supplied a custom designed delay system for the Pope's September 13 visit to San Antonio. The system was designed to cover one million people. "This will be the only one of the Papal visits that will be televised worldwide, so we will be heavily involved with all the interfacing," says **Wil Sharpe** of Showco before the visit. He adds, "We will be providing all the services for **Farm-Aid 3** this year in Lincoln, Nebraska."

George Thorogood and the Destroyers polished up some new tunes for their upcoming recording

session by taking a 15-venue, three-week long tour from New York to Minnesota. **Ultra Sound's** East Coast office supplied a complete Meyer house and monitor system with 20 MSL3s and eight 650 subs. Sometime soon Thorogood is supposed to begin a long fall/winter tour. Asked when it will start, production manager **Kevin Korecky**, fresh off the Oingo Boingo tour, says "We're not going out until after the World Series because George is such an avid baseball fan."

Schubert Systems Group's four touring sound systems were kept busy this summer. This year's popular **Bruce Hornsby and the Range** wound down a year-long tour in late July. Engineering were house mixer **Mike Ferrara** and monitor mixer **Alan 'Loon' Bonomo**. SSG has engineered every single show Hornsby has ever done in public. . . Other summer tours included **Al Jarreau, David Sanborn, Oingo Boingo,** and the **Doobie Brothers Reunion Tour**. . . Console rental company **Hi-Tech Audio** announced that it had leased its new Gamble **Series EX 56** house console to SSG for a long-term period.

This year's **Budweiser Superfest** tour in the southeast and east was handled by **Linear Sound Systems** of Oakland, CA. . . **Patti LaBelle, Luther Vandross, Atlantic Star, Ashford & Simpson, the Whispers, the Gap Band, and Gladys Knight & the Pips** were some acts that performed on the tour. The main PA consisted of 32 Turbosound TMS-3s, eight EAR M-1000 3-way cabinets and six double 18" EAR subs with a 40-channel Soundcraft Blue Board house console. Engineers were **Michael Graphix, Greg Rehberg, Kent Kline** and **Joshua Roberts**. . . Some of the artists Linear has been doing locally include **Kool & the Gang, Los Lobos, Jazz Explosion, the Lost and Found Amer-Asian Childrens Benefit,** and for the fifth year in a row the **Strawberry Bluegrass Festival** near Yosemite.

A benefit to raise money for a research center seeking to cure a hereditary form of blindness was held in August at the **Dorothy Chandler Pavilion** in Los Angeles. **Ultra Sound** supplied the sound equipment at the event which featured

—CONTINUED ON PAGE 170

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JOHN HIATT

Finds Peace With His *Family*

by **Iain Blair**

John Hiatt is a happy man these days. Tucked away in a secluded corner of the A&M lot in Hollywood, the 34-year-old singer-songwriter (and one of America's best-kept secrets) is reflecting on the critical acclaim greeting his latest album *Bring the Family*, and the long and winding road that has brought him to this point.

"The weird thing is, in the past when I've planned and agonized over recording, it's never really come out right," he says. "This time, we did the whole album in four days, with a pickup band, and everyone's going crazy for it."

But what a pickup band. Hiatt and producer John Chelew went back-to-basics with three of the most sympathetic players they could have assembled anywhere—Ry Cooder, Nick Lowe and Jim Keltner—and the result is Hiatt's most appealing, compelling album in years.

"A lot of it's autobiographical," he admits, "but I wouldn't want people to read too much into every line. I still write *fiction*. On the other hand, I suppose everything I've gone through, both in my private life and my career, shows up in some way in my music."

And in both areas, Hiatt has gone through a lot in recent years. There



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was the untimely death of his first wife, his continuing struggle with alcoholism ("it's a battle you never stop fighting"), his remarriage and move to Nashville. Professionally, there were also plenty of ups and downs—early albums for Epic, then two for MCA and three for Geffen before being unceremoniously dropped late last year.

Now with A&M, Hiatt is at peace with the past, and more optimistic than ever about his future. "When we finished *Family*, a bunch of labels wanted it—that's when I knew we had something," he says.

Mix: Are you pleased with the new album?

Hiatt: Absolutely thrilled with it, yeah. In the past, I've usually gone to the studio with a game plan, and had all the arrangements worked out, along with harmonies. But this time it was all totally spontaneous. I just put myself in the hands of John Chelew, the producer, and went with the flow.

Mix: It's a very stripped down sound from your past albums.

Hiatt: Again, credit where credit's due. The idea was all John's. He's the booker for McCabes [the top L.A. folk club] in Santa Monica, where I play occasionally, and he just came to me and said right out that he felt that my records never captured the honesty and integrity of my live shows, but that he also wanted to do more than just a solo album of me and my guitar. And that got me thinking. That's really how it all came together.

Mix: How did you go about deciding what players to use?

Hiatt: A lot of that was John's impetus, too. He knew that I'd toured with Ry Cooder and that we worked really well together. And then he felt Jim Keltner was simply the most sympathetic drummer for what we wanted to do. Basically, he came to me and said, "Get Cooder, get Keltner, get a great bass player, and then go in to the studio and just do what you do live with your voice and guitar. Choose ten songs, don't waste a minute, and just lay 'em down."

Mix: What about bass?

Hiatt: Well, originally we'd been considering using a guy in a local band in L.A., who's a great player, but for some reason we just couldn't make up our minds. In the end, John asked me who



my favorite bass player was, and I said "Nick Lowe." The next problem was finding him—this was literally two days before we were due in the studio, you understand—and when we eventually got him on the phone in Britain, he said "Sure," and hopped on the next plane. He walked in the studio without having heard any of the songs, while Ry and Jim had only heard my demos for the first time a couple of days earlier.

Mix: So there was hardly any time to rehearse the material?

Hiatt: None at all. I'd just sit there with my acoustic guitar, and say, "This is how the song goes!" Then we'd play it a few times and work out the arrangements on the spot, and then start taping. It could have gone horribly wrong, but I had the right players, and everyone was excited. It was really putting your music where your mouth usually is, you know. Shut up and just play.

Mix: So it was essentially recorded live?

Hiatt: Yep. All the vocals are live. There are no overdubs, apart from a couple of harmony parts, some maracas, and Cooder's electric sitar parts on "Your Dad Did."

Mix: There's a lot of dark and light in the album in terms of your songwrit-

ing. How would you describe your music?

Hiatt: Funnily enough I tend to think of myself as a blues singer, although I'm no student of the blues and I don't really immerse myself in that kind of music. I just like the idea of singing and accompanying yourself on guitar as a means of getting inside something, or perhaps *outside* something. That's what blues is all about to me. I'm not really a folkie, though people tend to put me in that category. Perhaps I'm more of a troubadour. But certain songs sound folky to me, like "Purple Rain" if you want to stretch it. I could hear George Jones sing that.

Mix: What about your own songwriting? You seem to be fairly prolific.

Hiatt: Fairly, though unfortunately not quite as prolific as I've made out sometimes! I guess I average about 20 to 30 songs a year, provided I'm not on the road for months at a time. Then it's difficult. I can't write in hotels and on the road. I've tried, but the songs just lack focus. Some people do their best writing on tour, but not me. I think it's 'cause I'm a homebody at heart. I'm too on edge when I'm touring, which is fine for performing, but not for writing.

Mix: What about the songs on *Bring the Family*?

Hiatt: Most of them were new and four of them—"Memphis In The Meantime," "Thing Called Love," "Your Dad Did" and "Stood Up"—were written the month before. The rest were written during '86. Writing is basically very enjoyable for me and a lot of fun. It's like that guy in the garage, making a tiny boat in a bottle. It's tinkering.

Mix: Do you usually demo songs first?

Hiatt: Yes. I'll get three or four songs together, and sing 'em into a little Sony cassette recorder—that's just so I don't forget 'em. Then I'll go over to this friend's 16-track demo studio and lay 'em down. It has real simple equipment—a Fostex recorder, a Tangent board, and some Yamaha digital outboard gear. First, I'll program a drum track on the Yamaha machine for each of the songs. Then I'll record a rhythm guitar track and a vocal, and I'll usually keep both. Then I'll add bass, and start filling it out with some other textures—perhaps some cheesy organ chords, or some incipient noodling, anything unnecessary!

Mix: Do you have a demo studio at home?

Hiatt: No. I'm ashamed to admit it, but I have all the equipment—a Teac 4-track and a board—and I've just never set it up. I just don't like the idea of recording at home. It's too close to the family, I guess. And to be honest, I'm also quite lazy. I work hard, but rigging all that up doesn't appeal to me.

Mix: So you're no tech head.

Hiatt: *Definitely* not! I just don't get it, mainly. I got into programming the drum machine because I always fancied myself a great drummer, like most rhythm guitarists. And it's actually something I can do quite well, and I enjoy it. But when it comes to stuff like synthesizers, players usually hate me, 'cause the only sound I've ever wanted them to make is a good, old-fashioned organ sound.

Mix: What guitar do you play?

Hiatt: A Yamaha acoustic, I don't even know which model. For strings I use Guild M450s, because they're the only ones that don't break on me. And I change them before every show, which gets expensive.

Mix: In the studio, do you take an

active part in the recording process, or pretty much leave it to the producer?

Hiatt: I leave the technical stuff to the producer and engineer. I *know* how my guitar should sound, but I don't supervise mic placement. And having done this for quite a while now, I'm pretty convinced that what comes out of any recording is mainly dependent on the music being played and the chemistry between the players. The technology can help get it across, but you've got to have the rest first, or it's much ado about nothing in my book.

Mix: So what do you listen for in the studio?

Hiatt: A feel, that magical performance that just captures the essence of the song or whatever you're trying to do. On this album, we left all the mistakes in—we quite liked them—as long as the take was the one. We did an average of just three takes a song, and we were also unanimous about which tracks were the hottest takes. The best thing was being able to immediately hear a complete performance. We'd cut the track, go in and listen to the playback, and there it was. It's a great way to record!

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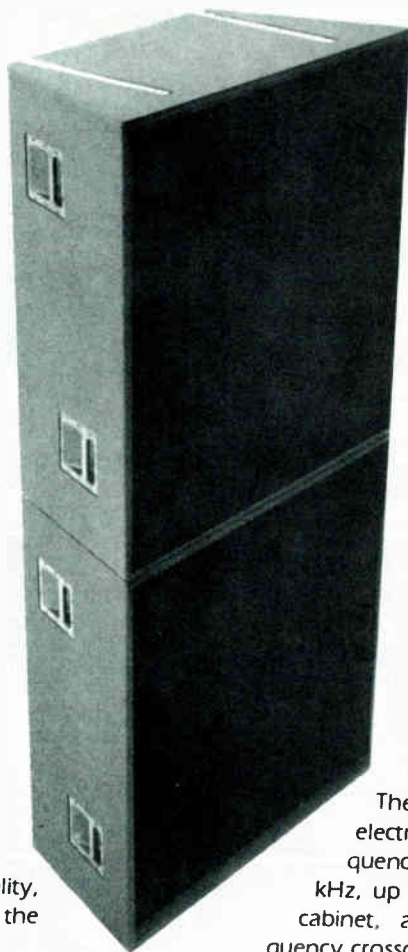
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Mix: This is your eighth album, which must make you some sort of veteran. Do you ever feel jaded?

Hiatt: Not at all. I feel more like a cat with nine lives. Every time I get ready to take a long vacation, my pesky career kicks back in. But seriously, I have no complaints. Before this album, I considered calling it quits. My priorities have changed over the last few years—I have a wife, two kids—and I didn't know what sort of album I wanted to make, whether it should be folk or harder. At one point I even toyed with the idea of putting out my demos as an album. That lasted about two weeks, when I realized it was far too self-indulgent. Then Chelew appeared and everything fell into place without my even trying, which must say something.



Mix: What sort of music do you listen to these days?

Hiatt: A lot of different things, though I haven't bought anything very current in a while because I've been so busy on the road. I'm pretty eclectic. I'll stick on Al Green, then perhaps the Chieftains or Prokofiev, and finish up with Howlin' Wolf. The only period I

never seem to go back to much is late '60s pop and rock, though I *love* Hendrix.

Mix: What music turns you off?

Hiatt: I have a real hard time with hyper funk-pop, with all those synthesizer lines and percussion. It's way too busy for my taste.

Mix: Who are your favorite producers?

Hiatt: I just love Nick Lowe—and not just because of this album and *Riding With the King* which he co-produced. His work with Rockpile, Elvis Costello, his solo albums—all great production. I also really like Don Covey, who did a couple of Howard Tate albums I love,

—CONTINUED ON PAGE 171

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PUTTING THE MUSIC IN MUZAK

by Josh Gressel

It's 3:30 on a hot Sunday afternoon in the parking lot of your local shopping mall. The asphalt's heat radiates insidiously through your defenseless Reeboks; its toxic smell envelops you like nausea. You are not happy, and the three children you are trying to load into your station wagon are not happy either. You all suffer from "mall burns"—overexposure to the deadly rays emitted inside shopping malls.

And yet, what is that tune you're humming, unconsciously but persistently? Your mind's last defense against suburban madness? And where did it come from?

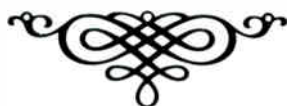
An Apologia

Let's be honest. Muzak® is an easy target for those in the music business. The idea to write this article was greeted coolly by my editor, who at first was uncertain whether it would be useful to *Mix's* readers.

Things weren't much different when I first contacted Muzak officials at their headquarters in Seattle, Washington. "What's your angle?" they asked suspiciously; apparently they have been victims of scorn in the press. It wasn't until I convinced them of my honest curiosity that they let down their guard.

OK, you ask, what *is* my angle? Why should *Mix* publish an article on "elevator music," as Muzak frequently is labeled?

One of the things I have come to appreciate about the U.S. (after living eight years overseas in a socialist system where things are decidedly different) is this: *nothing* survives in the marketplace that doesn't work. To wit, everyone makes fun of Muzak, and yet you hear it everywhere. Why?



To make fun of Muzak for not being like a Top 40 tune is like criticizing a studio engineer for not having stage presence—it's simply not to the point.



In researching this question, I came up with the following: 1) The purpose of Muzak is to increase your attention for the task at hand (such as shopping or working), not to attract your attention. To make fun of Muzak for not being like a Top 40 tune is like criticizing a studio engineer for not having stage presence—it's simply not the point. 2) Muzak is big business: it has 135,000 paying customers worldwide, with a "guesstimated" listening audience of 80 million. 3) Muzak is a major consumer of studio time: some 3,500 hours annually at independent 16- and 24-track studios throughout the U.S., Mexico, Canada and Great Britain (with all the attendant employment for staff and musicians). 4) Muzak personnel are painfully aware of their negative public image, and are working accordingly to change their musical style while still retaining Muzak's basic function.

So pocket that sneer, dear reader. Muzak is something you may want to know about.

Some Terminology

In the interests of accuracy, we need to get some terminology straight before proceeding any further. "Muzak" is a company name, not a generic one. There are other companies which market "background" or "environmental" music (see sidebar), but Muzak is the biggest and oldest. It was founded 54 years ago by George Squire, a retired general. He liked the name Kodak, which was just then coming out on the market, and coined "Muzak" to correspond to it.

Muzak produces three types of music: "environmental" (what is gener-

Muzak's program manager, Christopher Case.

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Mix magazine editor, David Schwartz (L) with 1986 award presenters Jeff Baxter and Cbeech Marin.



Engineer Bruce Jackson (R) accepts award for 1986 Outstanding Sound Reinforcement Engineer from presenter Cbeech Marin.



1986 award presenter and nominee Narada Michael Walden (L) clowns with TEC Master of Ceremonies, Ray Hanna.



TEC Awards nominee Alan Parsons (L), Mix editor David Schwartz and TEC keynote speaker David Pack share a moment before the 1986 ceremony.

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ally known as Muzak and which makes up more than 75% of their market), Foreground Music One or FM One (a compilation of contemporary music purchased directly from the artists; it is broadcast via satellite to consumers who want music without commercials), and "on premise" products (basically the same type of format as FM One but sent on tapes to customers who may want more ethnic types of music than are available on the FM One broadcast). Muzak pays full royalties to the original artists whose music is rebroadcast or rearranged.

This article deals with Muzak's "environmental" or "background" music, which will be referred to hereafter as "Muzak."

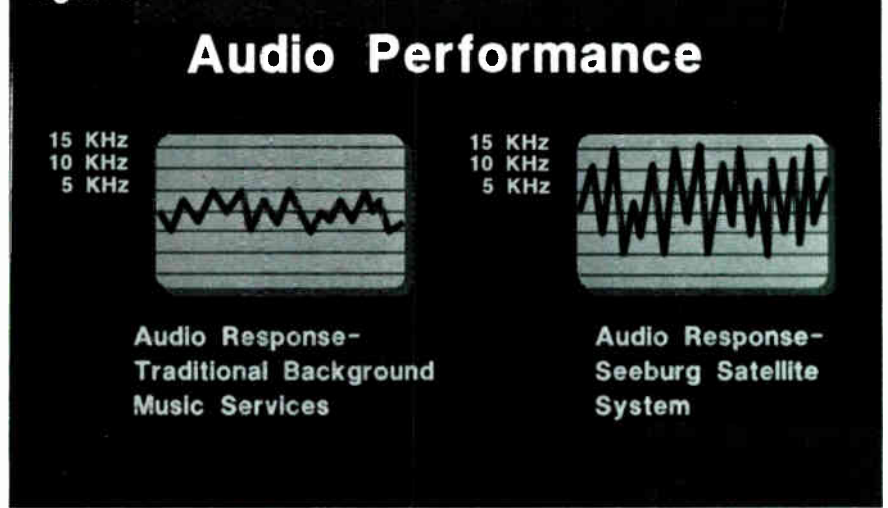
Muzak's *Raison D'Etre*— Stimulus Progression®

"The concept that underlies the programming for Muzak's environmental channel is a concept called 'stimulus progression,'" explains Bruce Funkhouser, director of programming at Muzak. "We have discovered that there can be a counterbalancing effect on the fatigue cycle that people experience at work. During the '50s and '60s there were a series of studies made to determine just when and how those fatigue cycles occurred and how music could most effectively be used to combat fatigue cycles. We found that if you raise the overall feel of music—a combination of tempo, instrumentation, meter and a few other factors—if you raise that over a 15-minute period, you can combat the fatigue. If you can adjust your daily cycle to produce the most stimulus at the times of the most fatigue, then you make work easier for people."

The studies showed that employees are at their worst in mid-morning and mid-afternoon. Muzak is constructed in 15-minute segments, with the music gradually building toward the end of each segment. These segments are patched together so that maximum stimulation (via tempo, meter, etc.) is heard during the mid-morning and mid-afternoon slumps. Thus, the drowsy office worker and the harried store clerk get a lift just when he or she needs it most.

Sounds great on paper, but does it work? According to a number of surveys conducted by outside researchers, it does. One typical study from the research literature supplied by Muzak showed Muzak to have in-

Figure 1



SEEBURG—"WE TRY HARDER"

Muzak is not the only company in the background music business, though it is the largest. Its major competitor is the Seeburg Music Satellite Network, a subsidiary of Capitol Broadcasting, located in Raleigh, North Carolina. According to estimates (from both Muzak and Seeburg), it has about 20% of the background music market nationally. The two companies compete for more than market shares: they regularly hire key employees away from each other, so that many of each company's managers gained their experience with the competition.

One such example is Bill Warner, a former vice president for Muzak and currently a Seeburg consultant (Christopher Case, background programming director for Muzak, was recently hired away from Seeburg). Warner describes the Seeburg difference:

"We are like Avis, we're #2. We're trying very hard. By leapfrogging the old technology of Muzak, we think we can increase our share of the market dramatically in the next few years."

Seeburg got the jump on Muzak in 1979, when they were the first to broadcast background music by satellite. Warner hopes they can repeat this performance in the coming year, with the introduction of a direct broadcast satellite network (DBS) on a KU band satellite. (Muzak reports they also are gearing

up for DBS broadcast, though they have set no definite target date.)

"This will enable us to bypass telephone lines, multiplex radio signals and tape players," Warner says. "We'll put a 27-inch dish on the subscriber's roof, and with that dish and with KU band satellite, which does not have terrestrial interference, we can send in multiple channels of music, each channel with 15 kHz bandwidth. This means that the music will have five times greater fidelity (see Fig. 1) than traditional background music over telephone lines or radio signals." Warner explains that the more powerful satellites (at 45 watts) will enable transmission at the high end of the spectrum, from 12 to 14 MHz (the present C-band is around 6 MHz). In addition, he said the smaller (and thus more aesthetic) receiving dishes will allow installation at small chain restaurants which presently can't install the 4-meter C-band receivers.

The new technology also will incorporate some new commercial wrinkles—technically possible but not implemented on the older C-band satellite system. It will broadcast eight to ten channels of different music, ranging from rock, classical, jazz and the traditional background, so that the subscriber can choose with the push of a button the most appropriate music for their working/commercial environment. Perhaps even more revolu-

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1,000 of them annually. It has no in-house staff of arrangers or producers (they explain that having staff arrangers would cause too much conformity in arrangement styles), and all recording is contracted out in blocks of anywhere from five to 25 tunes to studios throughout the U.S., Mexico, Canada and Great Britain. The average budget per recording, at block rates, is \$1,200, although some have cost as much as \$2,700. The person who oversees all this is Christopher Case, recently hired as Muzak's background programming director. I asked him to describe the "Muzakking" process.

"One of the things you have to look at is how the song is arranged in its original form," Case says. "Will it translate well into an instrumental piece and what will it take to make that translation? Some songs are more difficult than others.

"For example, Huey Lewis' 'Jacob's Ladder.' It's a tough song to make into an acceptable instrumental without making a joke out of it. It's the feel of the song. It's a hard rock song. In [the Muzak] format, those harder rock overtones stick out like sore thumbs. Yet we also want to keep a lot of what's already in the original song so that people can identify it when they hear it."

Case's formula for this "feel" seems to be "as much as possible but not too much." Where does he find an arranger who can cope with such directions?

"It is difficult to find arrangers who are capable of doing contemporary instrumental production for background purposes that sounds good," Case admits. (Incidentally, Case's desk could compete with that of some A&R people in terms of unsolicited demos. He reports that he receives roughly five tapes daily from prospective arrangers, and has a backlog of several hundred to be listened to.) "It's a special talent to be able to take a song by Paul McCartney or Tina Turner and make a good instrumental cover of it."

Tina Turner on Muzak? What's going on here?

No More Wah-Wah-Wah

"No one wants to listen to tired old songs and the quicker we can get the music in there, the happier our clientele is," Case says. "I'm trying to have them recorded while they're still on the charts. Traditionally, it may have taken up to six months or longer.



PHOTO: SEAN QUIGLEY

Muzak's (L to R) Jeff Cifka, Bruce Funkhouser, Mark Torrance and Christopher Case (seated), seen in the tape mastering studio.

Right now, the way I have it structured, we can get a song on in as little as two weeks if we have to."

Are things changing at Muzak from the days when Barry Manilow was standard fare? Case answers a most emphatic "yes," and changing Muzak's image is a theme he returned to often.

"We're trying to put *music* in the word Muzak," he said. "We're trying to strengthen the quality of the music. We are turning back some of the traditional sounds that have given Muzak a bad name in the public's eye. We want to get away from the elevator

—CONTINUED ON PAGE 206

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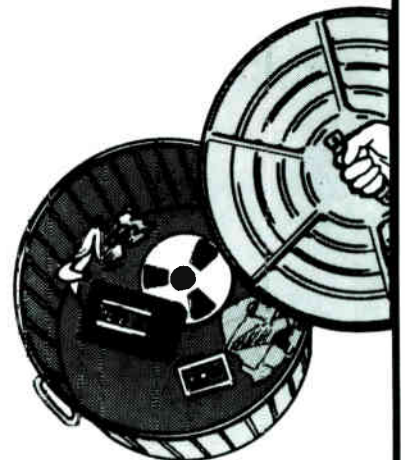
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GETTING NOTICED IN THE RECORD BUSINESS IS HARDER THAN IT USED TO BE

by Brooke Sheffield Comer

Over the past ten years, the music industry has seen changes, but basically retained the same goal: to find good bands with a different sound and marketable songs. Once found, however, are the sound and songs sufficient reason to thrust the band into the limelight? Exactly what does it take to break an act in the late '80s? That's the ques-

tion we posed to A&R executives and some successful new acts, who all agree that securing a major label deal doesn't come easy—if at all.

There are more ways to attract attention today. Management and production companies will help shop demos, and the burgeoning independent record industry is receptive to private pressings—made affordable by low-cost recording. Videos are a popular

means of introduction. Acts which fail to impress major labels in their own country may find favor overseas, and get picked up when they come across as an import, having proved their sales ability. But any way you slice it, breaking in is hard to do.

Many A&R people agree there's a demand for material with integrity and originality. Yet rampant conservatism makes it harder to stake the odds on originality. With more high-quality material coming across their desks, how do they evaluate the thousands of tapes they receive each month? Jim Lewis, vice president of PolyGram New York's International Repertoire, ought to know.

"Even though every A&R person has a different slant, we all have to be tough," says Lewis, himself a musician. Lewis listens "for integrity and great musicianship" in the 100 tapes he hears each week. That's only a tenth of what he receives (other A&R staff listen to solicited material too) and only about three out of that 100 get a second listen.

How does Lewis decide which three tapes he'll hear again? "I look for a spirit in someone's heart," he explains. That's not always easy to find, what with the tendency to lean on synths and to imitate current hits. The increased commercialization of the industry doesn't help either. "There's more concern to sell records than there is to make great music in the industry today," he notes, "and it takes great spirit to make records legends."

When style and sound don't match up in a marketable product, Lewis is adept at grooming his acts. When he signed Norway's American-fronted TNT, the act shed leather and studs for attire more congruent with their musical style, "which is more Led Zepelin/hippie-hard rock," says Lewis. In the world of MTV, it pays to keep visuals consistent with a band's musical genre.

Bob Singerman Management helps acts find and work with major and indy labels. Singerman hears tapes or sees live shows before negotiating with clients (who include The Smithereens). "Most management agreements vary extensively, ranging from a 15 to 25% take," he notes. Most contracts last five years, on a six-month trial basis.

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man worked on developing his groups with independent distribution, so they'd have a tight base of support to attract major labels. That's how The Bongos broke. "Before The Bongos had a major deal," Singerman notes, "they already had 35,000 fans in the U.S. and overseas who'd buy their LPs based on tours, press, indy releases and college radio."

Singerman notes that an artist may not need the services of a professional if he or she has a friend with common sense, hustle and energy. "When a band is just getting started, I advise them to tour and establish a market of their own before looking for a professional manager. A friend can usually help bands get gigs in and out of their area."

There's no doubt that audience support is valuable clout when approaching labels. But not all clubs, especially in major cities, are willing to give the stage to newcomers. When Jim Pullis opened his club, JP's, in New York City 15 years ago, his goal was to recruit fresh talent. "There was no free exchange between the record companies and the talent then," he explains. His club, regarded by the industry as a showcase spot, gives musicians a place

to hone their styles. While they're playing, Pullis' rapport with the industry brings in A&R executives on a regular basis.

Most clubs book bands but at JP's, "bands book us," Pullis says. Artists pay \$100 to cover the sound and door, and if they have no draw, they don't come back. But everyone gets a chance, and Pullis gets as many tapes as most A&R people. "I listen for presentation," he explains. What's his advice to artists? "You've got to be great, because there are so many great artists out there. If people don't tell you you're great, keep your day job."

Innovative visuals excite Manhattan Records A&R man Bruce Garfield. "You should not only have musical prowess," says the former vocalist/harmonicist, "but a visual presentation, a personal signature, like David Bowie or Brian Ferry." Acts like Chicago have succeeded without stage shenanigans, but Garfield likes to *look* at the style of the sound he hears. When he sorts through the 300 tapes he receives each month, unique graphics catch his eye first. "Sometimes I'll listen to something because it's packaged well, or has a quirky sense about it."

Like most of his colleagues, Garfield only listens to material solicited by a reputable source—attorneys, managers, producers or promoters. He also keeps a close eye on the indy labels, college radio charts and club activity. Garfield stresses the importance of demo tapes. "Make sure your tapes are solicited," he warns, "because unsolicited material will get you nowhere." Private pressings get the nod at Manhattan Records, because "someone on the staff listens to all the records that come in." When Garfield screens tapes, he listens "from the gut, for something innovative, not necessarily a hit single." As an example, Garfield cites the demo of Glamour Camp, fronted by Chris Ocasek (son of Ric Ocasek). Garfield was impressed that each cut had a different sound, "that allowed them to defy the norm and still be accessible." Garfield offered the group a development deal, and today they're working on material.

Garfield stresses that everyone making good music has a fighting chance. Artists in major music capitals may have more opportunity to make contacts, but no matter where you live, "you can always make contact with the

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most professional source in your area." Garfield receives tapes from regional company reps and promoters on a regular basis. "Program directors at local radio stations are a good bet, too," he notes. And when an act does attract label interest, he recommends scrutinizing prospective record companies before signing a deal. "Bands have to look into the different aspects of a company just as closely as those companies look at bands," says Garfield. "Find out who else is on the roster and assess how well you and your music will fit it." Not everyone may have hit material, but Garfield is sure that anyone who tries hard enough will be heard.

Perseverance and talent steered The Smithereens from the early '80s' New York club circuit to chart heroes. They didn't break overnight; none of the members had inside connections or industry exposure. They simply wrote and played their own music "anywhere and everywhere we could," according to lead singer/songwriter Pat DiNizio. Coming in on the tail end of the original NYC new wave scene (that saw Patti Smith, Television and the Talking Heads signed out of down-

town Manhattan's infamous nightspot, CBGB's) when major labels had a virtual moratorium on signing new talent, the Smithereens fended for themselves, rehearsing in the DiNizio family basement and pressing their own four-song EP *Girls About Town*.

For about \$1,000, the Smithereens took the self-produced-single-as-calling-card route. "That price included the pressing of 1,500 singles, plus picture sleeves," DiNizio recalls. "So even though we had no sales, and no promotion, we could walk into a club and give a professional presentation." That's how the Smithereens began to book cover dates, "the only dates that really paid." Payment in turn went toward the production of a 12-inch EP, *Beauty and Sadness*, which went toward getting the act major independent distribution, a Scandinavian tour, and a glowing review in *Rolling Stone*. Despite the critical acclaim that led to a Smithereens deal with Sweden's Wire Records, they failed to get a U.S. deal.

"We had no choice but to keep going," says DiNizio. "We wrote new material and booked dates around the country to expand our audience. We made no money, we went into debt,

but we'd made a decision to stay with it." Otis Blackwell (who penned such tunes as "Return To Sender" for Elvis Presley) gave the band the break that dredged them out of debt when he invited The Smithereens to tour and cut two LPs with him. "After years of janitor gigs and proofreading for insurance companies, we were finally paying our bills by playing music," DiNizio says. When it came time to market the five tracks DiNizio himself produced at New York's Record Plant, "Having been turned down by the majors more times than I can remember, we opted for major indy labels." A week after sending a tape to Enigma Records, he got a phone call. "They wanted to sign us. It was as simple as that."

When the duo Carboy hit the chart trail three years ago, guitarist Ralph Scibelli and vocalist Barbara Carboy shopped the 8-track tapes they produced in their home studio. Since then, they've played in many Manhattan clubs and signed a production deal with ex-Chic keyboardist Andy Barrett's Lionella Productions. They're sure there's a major label deal in their future.

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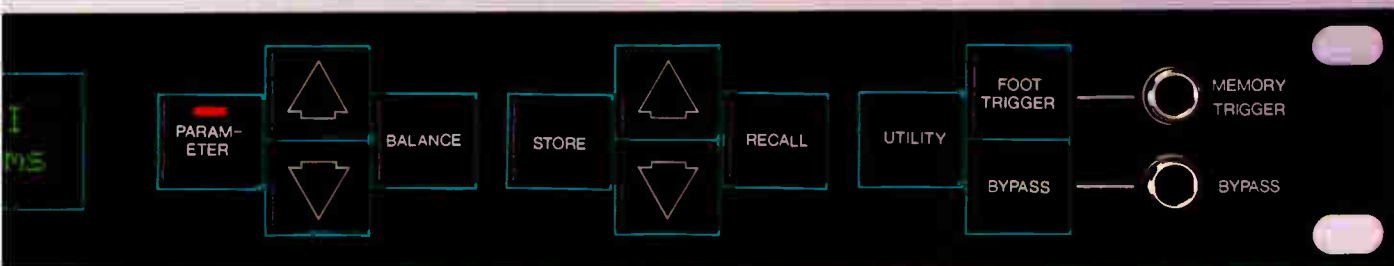
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Electronic production techniques using MIDI and SMPTE sync require more control than a "wire with gain" can provide. But as functions and components accumulate, the console's signal path has grown more complex, and its audio performance has suffered. On analog recordings, higher levels of crosstalk, noise and intermodulation were an acceptable price for additional control. On digital multitrack, however, these flaws become glaringly obvious.

Crosstalk blurs the stereo image.

Now that digital recorders have virtually eliminated crosstalk, this is an especially annoying problem. *The AMR 24 matches the channel separation performance of digital multitracks* because it employs balanced buses that eliminate crosstalk the same way mic inputs do. This radical design approach takes full advantage of digital's more coherent stereo imaging.

Balanced buses also eliminate the intermodulation that plagues the sound of conventional "virtual ground" mix amps. *The AMR 24's noise floor is constant whether you route one input*

to a group, or thirty six. So you can concentrate on the music without distractions from the mixer, even on digital multitrack.

Features shouldn't degrade audio performance.

Automation widens creative possibilities — and narrows the margin for console error. For example, FET mute switches that are "silent" individually can produce audible glitches when grouped. The AMR 24's carefully controlled switching time constants eliminate this problem.

Every circuit in the AMR 24 has been calculated with equally close attention. Each stage has at least 22 dB of headroom; total dynamic range is over 100 dB. Even so, *unused stages are bypassed to produce the shortest effective signal path in every operating mode.*

Perhaps the AMR 24 is a product of extremist engineering. But as we see it, optimum audio performance, not simply a revised layout, is what makes a console automation- and digital-ready.

The feel is familiar, the functions are unprecedented.

The AMR 24 facilitates innovative production techniques within a classically

split configuration. Master Input Status switches select mic inputs or line returns on all input channels simultaneously. In its mixdown configuration, the AMR 24 will handle up to 60 tracks, because the 24 Track Select switch changes the monitor returns to line returns normalised to your second 24 track (or to synchronised "virtual tracks" from synthesisers and samplers). The monitor returns have aux buses, solo and mute, plus four bands of EQ and long throw faders, so this flexibility is achieved with no loss of audio quality. For additional effects returns, the Fader Reverse function creates an additional 24 patch points through the cue send faders.

Imaginative design and uncompromising construction give the AMR 24 flexibility and sonic transparency that represent clear achievements: especially clear on digital recordings. For all the facts on this innovative console, send your business card or letterhead to:

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Home recording gave Carboy an alternative to hourly studio rates, while visual innovation helps their image. The duo's unusual hair, make-up and wardrobe won the attention of a producer at Andy Warhol's Studio, who promptly booked the act to appear on Warhol's MTV special. "We relied on visuals more when we started out looking for dates," explains Carboy, "and considering our lack of experience, we got some incredible gigs." Minus eyebrows, wearing spray-painted body suits, orange hair and kabuki make-up, she recalls feeling "like a gangbuster going in on cold calls to clubs and record companies, shocking people." Since then, she and Scibelli have targeted their goals. Gone is the spray paint, and in its place has evolved confidence in writing, arranging and performing (the eyebrows have grown in, too).

Despite the proximity of the record industry, Carboy find New York a tough town for aspiring artists. "You can get eaten up fast," says Scibelli. "There's a lot of creativity, but the club circuit is very political. You can expend a lot of energy and only progress as far as the clubs you're playing. We've found many club owners too interested in promoting their own acts, now that club-labels are all the rage."

Like their colleagues The Smithereens, Band of Outsiders started playing in New York clubs around 1980. And like Carboy, they had no initial game plan. Seven years after their first club date, frontman/rhythm guitarist Mark Jeffrey is still cynical, but wise. If he could do it all over again, he says, he'd take a more calculated marketing approach.

Band of Outsiders finally has an album distributed by a major label—Barclay, a subsidiary of Phonogram France. The band had toured and recorded in Europe, where they secured a deal with Barclay, and came back home as an import.

Why didn't the Band of Outsiders break in America first? They might have, Jeffrey believes, "if we'd sent our test pressings out to clubs, and gone out and toured on the strength of the single. Instead we only made a spastic stab at using the record as a calling card. Pretty soon it was old news." He urges young bands to get distribution for their independent pressings ("the indy industry is a lot more organized today than it was seven years ago," he notes) and that helps get the records to college radio. "Bands don't come



out of nowhere," he observes. "The ones that break without major support come from college stations, which are sympathetic to indy labels. If a song is good, college radio will play it forever. Once you've got airplay, club promoters will guarantee you enough to cover the cost of a tour." Low funds kept Band of Outsiders locked in New York for years. When they did begin to tour, it was international rather than national renown that set them free.

A self-financed tour of Europe won the interest of indy labels in England, France and Sweden. When the French indy Invitation To Suicide proposed a record deal and expense-paid tour, Jeffrey and company were one happy act.

In France, close to completing their LP for Invitation To Suicide, the label suddenly folded, leaving Band of Outsiders stranded, and heir to nothing but studio bills. "Always ask for a return ticket," says Jeffrey, who didn't. "We lived on a can of sardines a day." At a loss for francs, Jeffrey finagled a "benefit" concert in Paris, which provided the band with airfare back home. It also drew rave reviews and managed to sell the product initiated by Invitation To Suicide to Barclay/Phonogram.

Felix Cavaliere points out that 20 years ago you could get signed if you were simply a good band with a different sound. "How you played was more important than how you looked," says the former leader of The Rascals, who were signed by Atlantic Records years ago after the company president heard the band at a Long Island club. Today, Cavaliere sees good American talent "going under the bridges" as a result of industry economics.

If production costs hadn't escalated

so drastically, American acts might have a better chance, "but the price of producing, promoting and distributing an album has elevated tenfold," Cavaliere points out. "What was a ten or 15 thousand dollar bet 15 years ago is a half-million dollar gamble today. Consequently, record companies look to the overseas markets, which are much smaller, find the hit, bring it over here, and take all the credit by signing up the act." He's not knocking overseas talent, but Cavaliere wants to see Americans get a listen.

How do changes in the industry affect what we hear on the radio today? "There are more one-hit wonders now," says Cavaliere, "and very few people who've sustained a career of two to three years." Marketing programs have a lot to do with that, "because it's important to have a lot of money behind you. In the old days, if an executive heard someone with talent, he'd put his tail on the line to help that person make it. Today, no one has that nerve. Their jobs are in jeopardy." As a result, even though more people compete, fewer than ever actually get to run the full race. And those who *do* participate don't necessarily last long.

What would Cavaliere do to help aspiring talent? "I'd start my own label," he says, "and distribute all the people that deserve to be signed to major companies. And it would be the best label the world's ever seen." ■

Brooke Sheffield Comer, who holds degrees from UC Berkeley and NYU, spends her days involved in graphic arts and filmmaking. During her spare time, she works on expanding her Casio collection.

FIELD · TEST

by Matthew Sutton

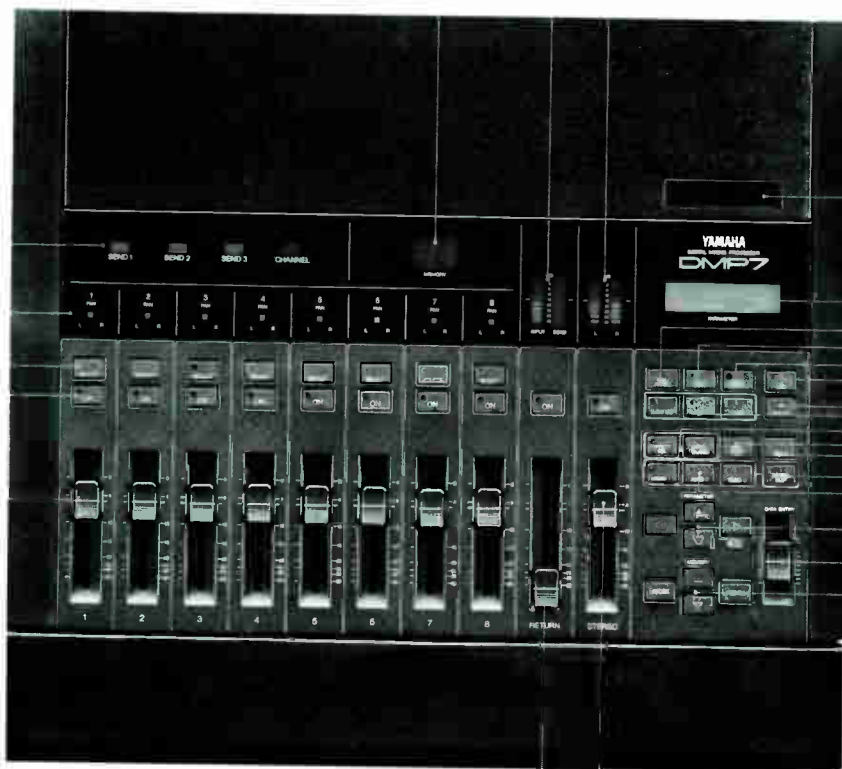
YAMAHA DMP7 DIGITAL MIXING PROCESSOR

Unveiled to the world for the first time at last year's AES Convention in Los Angeles, the Yamaha DMP7 is an 8 x 2 mixer which functions entirely in the digital domain. As signals enter the mixer they are immediately converted into 44.1kHz, 16-bit digital signals, and they remain in the digital domain until the stereo output.

The mixer features digital equalization on each channel, three effects

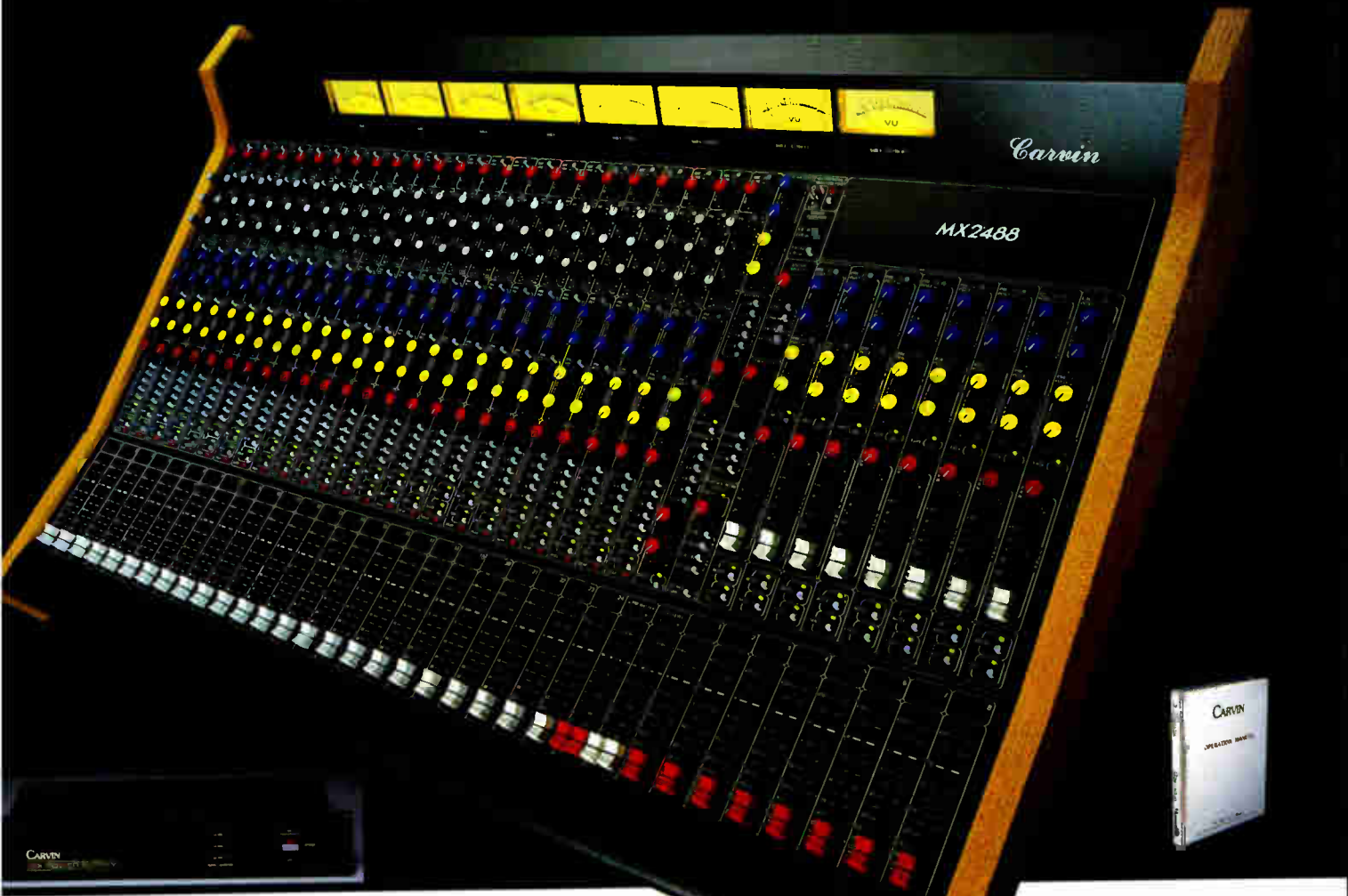
sends (each individually adjustable), as well as the return level and pan to the stereo mix. The stereo mix passes through a digital compressor before it is converted back to analog and leaves the console. The mixer includes three built-in effects processors, two of which are very similar to the Yamaha SPX90s; the third being a stripped-down version. The first two effects sends may only be used with the built-

At right: top and back views of the DMP7. Note that rear panel includes balanced +4 dBu XLR as well as 1/4-inch unbalanced outputs, connectors for cascading several DMP7 units, and MIDI in/out/thru ports.



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The MX2488 is professional—right down to its modular design and outboard rack power supply. A recent MX1688 test review quoted: "Total harmonic distortion at mid freq. measured only .025% while line inputs measured only 0.01%—very low for a console of this type."

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"Having lived with the Carvin MX1688 for a couple of weeks before reluctantly sending it back to the manufacturer, I can attest to the fact that it is truly targeted at the professional recording engineer or sound reinforcement engineer."
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 Len Feldman—db magazine
 September/October—1986

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in processors, while the third effects send is for use with an external effects device and then allows use of digital EQ on the return.

Since this is a Yamaha product, it is no surprise that the DMP7 has been designed so every control in the mixer can be accessed via MIDI. You can control the mixer from a sequencer, a foot controller, or even a DX7. The DMP7 also has the ability to store snapshots of all the controls in up to 30 memories (97 with the external cartridge).

Inputs are unbalanced line-level only; mic preamps (eight balanced-line with switchable phantom power) are available with the optional MIA7 accessory. The line inputs allow use of any signal level from -20 to +4dBu, with detents at -10. Both balanced and unbalanced outputs are provided for the stereo out, each running at +4dBu nominal. A single output for send 3 with stereo return and a headphone jack complete the audio connections. Other connectors are for MIDI, digital cascade (you can cascade up to three of these mixers) and a footswitch.

The front panel is very simple looking with ten faders, a number of buttons, a numeric display, an LCD display, and what Yamaha refers to as a data entry slider. With these, one can control all the features of the unit.

Three bands of fully parametric digital EQ are provided on each input. Low and high can be shelving or peak dip; with a Q that varies from .1 (almost a volume control) to 5 (a very narrow notch). Each input also can send to any of the three effects sends, pre- or post-fader, with independently adjustable levels. Solo and muting are also provided.

Individual channel levels are controlled by the channel faders, as are the effects send levels. To adjust the level to effects send 1, for example, you merely select send 1 in the master section and hit fader flip. The faders move quickly (they are motor-driven) to the position last set for all the channels to send 1 with the return fader moving to the last set level for effects return 1 into the mix. Then each input can be adjusted for its individual send level. Selecting another send, the faders move again and the levels then can be adjusted for that send. To return to input control, all that is required is to

hit fader flip again and the faders resume their proper position.

Equalization is controlled by using the LCD display, and manipulating data with the master controls. The parameters available are frequency, boost/cut, peak/shelving select and Q. Cursor keys are provided to move about the window; incrementing or decrementing is accomplished in two ways. First and most accurate are the up or down keys which nudge, as the British say, whatever is being adjusted up or down by one increment. The button may be held down and after a short delay really starts zooming. The other method of adjustment is via a soft knob, or more

appropriately soft fader. This is another motorized fader, which I like to refer to as "Yamcam," and can be moved up or down to adjust any selected parameter. The fader is quite rough in its resolution however, and the only way to get exactly where you want is by using the up/down buttons.

To add a little 10kHz to channel 3 you first choose channel 3 by pressing its "select" button, select Hi EQ, using the cursor left/right keys move the cursor to the frequency select, punch the up or down button to get to 10kHz, move the cursor to the boost/cut and push the up button to add the desired amount of gain. The Q defaults to .7,

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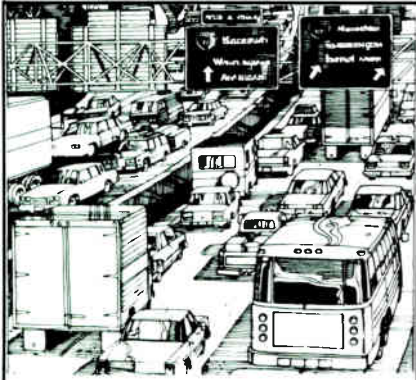
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which is a very pleasant bandwidth. You can toggle the EQ on and off by pushing the EQ hi (or mid or lo) button over and over, so comparison between non EQ'd and EQ'd is simple. After a small amount of practice, the

**“The DMP7 is a
major leap for-
ward, both in
technology
and ease of
use.”**

whole operation of adding EQ can be accomplished faster than you can read this paragraph.

All other adjustments of parameters are as simple. The effects processors program and parameter selection, output limiter, and so on all are adjusted using the display and control keys.

The DMP7 appears to have been designed as the hippest keyboard mixer in the universe. This, however, serves to explain some of the shortcomings. The specifications are very good in comparison to a regular garden variety mixer. However, the platinum shine of digital does have some tarnishes in this product. Most notable is the lack of overall headroom. Meters provided would appear to be adequate for preventing unwitting overloads. The truth is that headroom appears to be only 15 dB above 0 on the input meter provided. This seems limited to any one with experience on professional format digital, which generally has 24dB above 0 VU before clip. Also, the low pass filters seem to be pretty average, with less than sterling phase characteristics. So even though we have many of the benefits of digital audio included in this mixer, we are unable to fully realize them because of the limits of the A-to-D and D-to-A sections. This is only to be expected for the cost of the unit, which is absurdly low in comparison to other manufac-

turers who are at this time making consoles that most people read about, and may never see. The difference between the DMP7's under-\$4,000 price and a \$100,000 digital console is substantial.

The point is that, although this is one of the neatest mixers I have ever played with, a marvel of engineering and manufacturing, it has limitations inherent to its price that keep it from being a truly professional recording console. Bright, creative people (of whom there are many in this industry), doubtless will find thousands of uses for this mixer. And they will be very happy with its performance, and price. Unfortunately, some unlucky souls will seize the DMP7 as being wonderful for its “digitalness” and lose sight of the context in which it was produced.

Using the mixer in a session for a simple 4-track mix proved to be both fun and enlightening. Its digital equalization sounds great! It's possible to do things you might not believe, including adding some pretty radical EQ that works. Ease of operation was proven beyond a doubt, and the project definitely does not sound like a 4-track project.

After a short time with the mixer, one develops the habit of keeping the right hand on the parameter and adjustment keys, and using the left hand to select and adjust faders. This keeps things moving pretty fast, and after a short while, you don't miss all those absent EQ knobs. As a matter of fact, it isn't long before you begin to wonder why other consoles have all that clutter.

The short taste of digital EQ leaves one wondering how long it's going to be before some clever, forward thinking manufacturer develops a stand-alone EQ. The quantity that would likely be sold would certainly justify looking into the idea.

The MIDI implementation is quite good. As mentioned, every setting can be controlled dynamically via a sequencer, or all settings can be memorized in snapshot form, for resetting instantaneously from memories. Documentation for the MIDI implementation is very thorough, with examples given of almost all functions that Yamaha is aware of.

The DMP7 is a major leap forward, both in technology and ease of use. Other manufacturers would do well to emulate Yamaha in ingenuity, documentation and thoroughness of design. ■

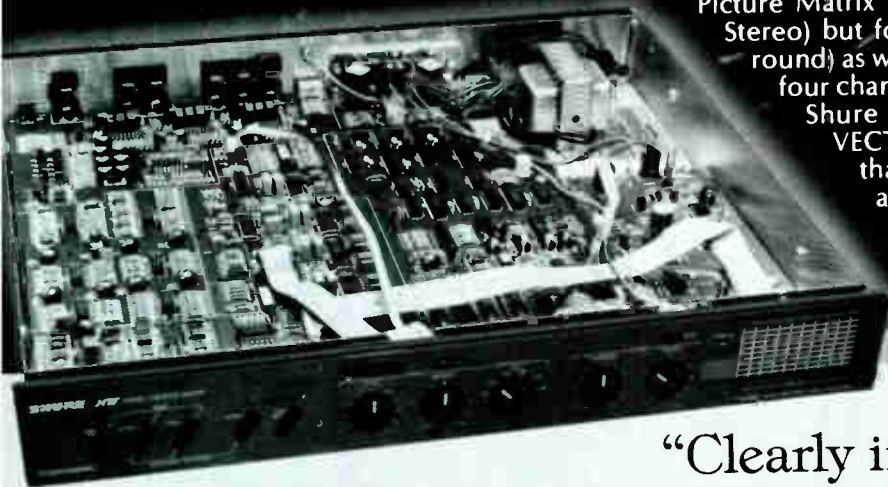


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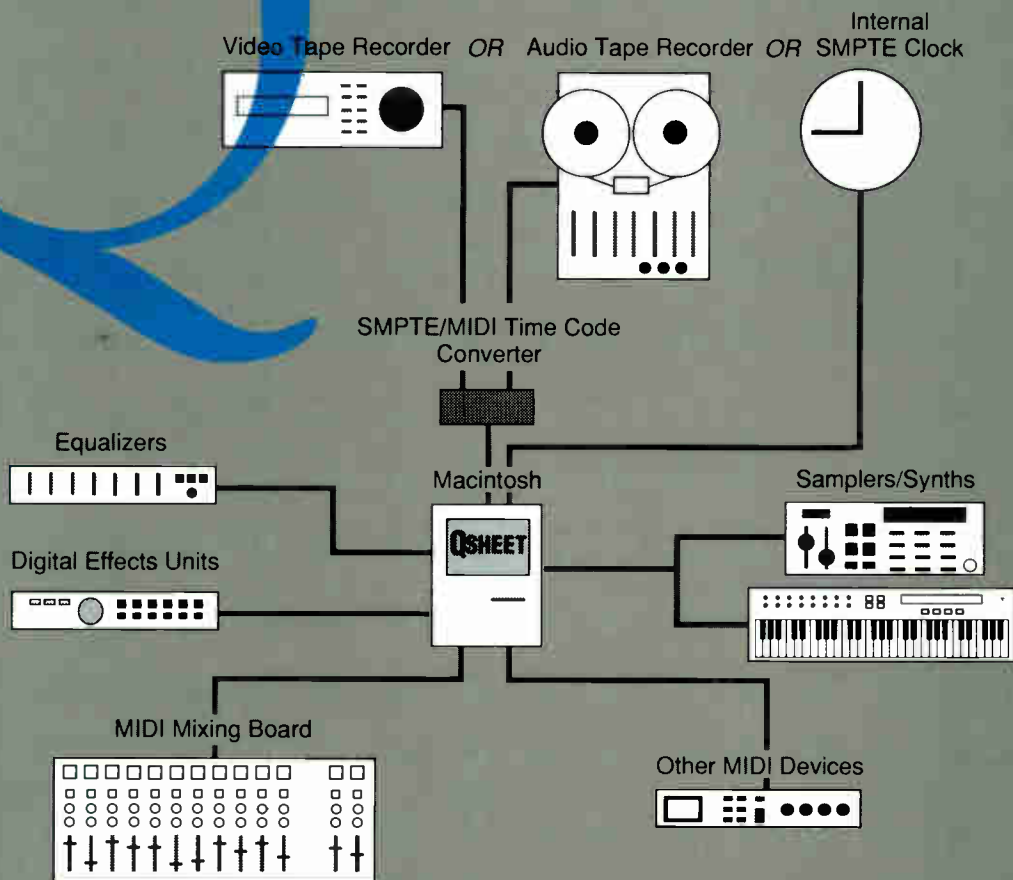
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If you're into MIDI, Q-Sheet should be in your studio. Q-Sheet turns an ordinary Macintosh computer into a complete MIDI automation center, capable of automating effects units, samplers—even an entire MIDI mixing console—with SMPTE-locked precision. Using appropriate MIDI gear, Q-Sheet can automate every aspect of an audio mix down or generate complete video soundtracks.

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devices, you can trigger sounds, add signal processing, and mix down the entire soundtrack directly to two-track. You even have complete SMPTE offset capabilities.

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Requires Macintosh with minimum 512K and MIDI interface.

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Another keyboard trend was the increasing sophistication of "personal" keyboards designed for home use. Technics (with their "Digital Ensemble"), Kawai, Yamaha, Korg and others have taken high-end musical technology and adapted it for the home by putting sampled sounds, drum machines and elementary sequencers into "home entertainment" type keyboards. Maybe it won't be long before MIDI is a household word.

There was a wide variety of signal processors; here are some of the highlights. Alesis introduced three more effects in their "micro" series to go along with the MicroVerb: the Micro-Enhancer, MicroLimiter and Micro-Gate. The limiter and gate do what you would expect; the enhancer could perhaps best be described as a kind of dynamic treble booster. DigiTech showed off their Pedalverb, which is an honest-to-goodness digital reverb in a pedal and Roland countered with the RV-2, a digital reverb pedal for under \$200. ART featured the IEQ (Intelligent graphic Equalizer) in a very convincing demonstration: they turned all the bands up to +15 dB, dropped the overall level 15 dB, then switched back and forth between the straight and processed sounds—there was virtually no difference, and some showgoers heard no difference at all.

For guitarists, the Roland GP-8 combines several popular effects based on their Boss line into one rack mount, programmable unit that responds to MIDI program change commands. Yamaha didn't forget the guitarist either. Their REX50 is a descendant of the SPX90 that includes digital distortion (deliberate digital distortion, that is) and signal processing algorithms for reverb, compression, gating, delay, etc. And Lexicon updated their PCM70 with new software that adds 40 new presets, expanded dynamic MIDI options for controlling parameters over MIDI, combination chorus/echo programs, and more. Aren't EPROMs wonderful?

AMR came out with a bunch of new processors: the DSR 100 (stereo digital reverb with MIDI), PME 4 four-band parametric equalizer, CDS 2 dual-channel compressor/limiter, and NGT 2 dual-channel noise gate. All prices were competitive with anything else at the show, including products made

offshore.

Over in sync-land, Yamaha's MSS1 synchronizes MIDI devices to SMPTE time code as well as being able to generate SMPTE. Meanwhile, AMR's SyncController can lock recorders, read and write SMPTE, and sync MIDI devices to SMPTE for under \$1,000.

And of course, what would a NAMM show be without the usual assortment of MIDI fix-it boxes and accessories? One of the more interesting was Digital Music's MX-8 (\$395), a combination MIDI patchbay, merger, MIDI delay unit and mapper that performs additional functions such as MIDI filtering, channel-shifting, transposition, veloc-

ity cross-switch and so on. AMR also had the MIDI Manager, another "Swiss Army knife" kind of system controller.

In computers, although the Mac is still firmly ensconced in high-end musical applications, it no longer enjoys the huge lead it once had. IBM-PC compatibles are making tremendous inroads in the music market, as is the Atari ST series. In fact, Atari is now the first computer manufacturer to begin selling its line of personal computers—including peripherals such as hard disks and modems—through music stores. While most computer makers shun "vertical markets," it seems that Atari actively is cultivating musicians.

QUESTION:

Who invented and manufactured the original magnetic tape recorder?

- A. Edison
- B. Ampex
- C. AEG

ANSWER:

AEG, in 1935, and since then we have been continuously designing and manufacturing the audio tape recorders by which all others are judged.

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AEG

THE ROOTS OF THE INDUSTRY

Perhaps this will inspire other manufacturers to realize that the musician's market is not only significant, but well worth pursuing.

The most interesting IBM compatibles are complete systems, such as those from CMS and RPMicro, that are specifically designed to spend their lives not on a desktop but out on the road. Yes, the day of the rack mount computer for musicians has arrived. Music education for the PC seems to be on the upswing, and interest in IBM's Music Feature also contributed to putting more of the spotlight on the PC.

And where was Commodore? Although the venerable C-64 still could be seen here and there, it seems that musicians are more interested in clones or STs for budget music applications. However, many musicians are holding on to their Commodore 64s, and this will represent a large installed user base for some time to come. The real casualty at the show, though, was the Amiga. Its presence was minimal, which is a shame considering how capable this machine is. It would be interesting to see where the Amiga would be today had it ended up in Jack Tramiel's hands (the person who guided the ST to success after Amiga

DigiTech's Pedalverb



hooked up with Commodore). Maybe the Amiga 500 and 2000 will do what the Amiga 1000 couldn't: make people understand this is a great machine.

Meanwhile, Apple fans were going nuts over the promise of the Macintosh II. While Mac IIs were only visible at a few booths, and its expense will no doubt limit its potential base of owners, this computer surely will carry on the "high-end" tradition of the Mac for music applications. Conspicuous by its absence, however, was the IIGS, the latest version of the Apple II. Perhaps Apple sees this as more suited to the educational market, or perhaps they're perfectly happy to keep pushing the Mac for musical applications; whatever the situation, the Apple IIGS didn't have much presence.

The wild card in all this is Tandy. They don't seem to be too interested in promoting their wares to the music market, but they achieved quite a lot of success with their 1000 series, and their latest computers look extremely cost-effective. The clone market for musicians is wide open right now—no one company has come forward to try to get musicians to get their particular brand of clone. Perhaps Tandy, thanks to its channels of distribution and marketing clout, should give it a try.

Out of space again! Oh well, there's always next month. 'Til then, keep your disk drives clean and your AC surge-protected. ■

Craig Anderton edits our sister publication Electronic Musician, and is guitarist/keyboardist for the synth band Transmitter, as well as author of numerous books and articles for MIDI users.

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KURZWEIL™

Music Systems

RANDOM SAMPLING

Volume I

Notes & News from Kurzweil Music Systems

Issue No. 4

KURZWEIL 250™ AT USC... "Seminar in Electronic Music, Computers, and MIDI," sponsored by the USC School of Music, included lectures by **Clark Spangler** and **David S. Mash** and hands-on instruction on the 250. **SPANGLER**, internationally-known synthesist, talked about **digital synthesis and sampling** adding, "The 250 is one of the great orchestration tools. You've got the freedom to do what you like to do." **MASH SAYS...** "I spoke almost exclusively about the 250 and demonstrated one. It excels for composers, arrangers, and orchestrators." Mash, who's **Chairman of the Music Synthesis Department of Berklee College of Music**, wrote the new **Kurzweil 250 User's Guide**, so he definitely knows the 250. **250 USER'S GUIDE REVISITED...** Still don't have one? See your Kurzweil dealer. **HAVE A MODEM?** Dial into the Kurzweil User's Group on **PAN**, a VideoText network that you can access with your **Macintosh™**, a terminal program and a modem. You're just a phone call away from the factory and from other Kurzweil users. Swap sounds, trade information and more. To sign up, refer to your manual or write to us. **IF YOU'RE REALLY INTO MIDI...** The **Kurzweil MIDIBOARD™** is the ultimate studio and performance controller. 88 weighted wooden keys give you the feel of an acoustic piano, with attack and release velocity plus mono- or polyphonic afterpressure. Program it to transmit on

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one touch of a button or pedal switch. Front panel sliders give you real-time control over the MIDIBOARD's response. Twelve assignable controllers let you modulate any function your synth can receive over MIDI. **SHORT ON MEMORY? SUPERAM I and II** expand the **KURZWEIL 250's** sampling memory to one or two megasamples. With **SUPERAM II**, you can have four banks of up to 100 seconds sampling time each, depending on sampling rate. Load four times as many diskette-based sounds into RAM for immediate access. And remember, the 250's sampling memory is completely separate ROM...all samples can be used together and in layers with the **KURZWEIL 250's** preset sounds in RAM. **150FS CONTINUED...** Did you get the free **Version 1.6 software upgrade?** Or the free **Voice Block B upgrade?** If you didn't, see your Kurzweil dealer. **QUESTIONS?...** Write to us at: **Kurzweil Music Systems, Inc., 411 Waverley Oaks Road, Waltham, MA 02154. Over.**

—FROM PAGE 120, SANDBOX

with the Necam automation and the 46-track synchronized recording enabling extremely complex overdubbing and mixing to be performed and experimented with, to the artist's content. No wonder the place is popular with producers!

In the end, though, it is not the environment, equipment, or even the organization that makes a studio like the Sandbox work—it's the people. "If you stripped away Skies' section, you'd still have a fully functional recording studio," says Bach. "What makes it different is the interface between all the keyboards and what I have in the front of the room. The major thing is the interaction between the two of us as engineers; how we set up sessions logistically. What he has and what I have combine together to make something that is one-of-a-kind." ■

Prolific writer Larry O is a musician, sound engineer and electronics technician. His SF-based company, Toys in the Attic, offers consulting services in the fields of MIDI, product documentation and signal processing, and is affiliated with Russian Hill Recording.

—FROM PAGE 137, NEWS

Stevie Wonder. A half-million dollars was expected to be raised to fight retinitis pigmentosa, a disease that strikes children and young adults.

Getting bigger and better is **Sound On Stage.** This West Coast sound company now can support four major tours at once and has been doing so throughout the summer. By designing and manufacturing their own Power Physics speaker cabinets, and buying four Gamble house and monitor consoles, and leasing a fifth, **SOS** has managed to expand and build up their newest touring systems in a short time to meet their client's demands . . . Continuing their year long stint, **Huey Lewis and the News** just got back from Japan and plan to complete their tour sometime in late September. . . **Eddie Money's** US tour ran from February through late August with house mixer **Geoff Ganiford**, monitor mixer **Bernie Fromm** and engineer **John Faldetta** . . . A seven-month **Night Ranger** tour began in June and travels across the US and over to Japan, while the revitalized **Starship** go out nationally from July through October.

IRAN-CONTRA HEARINGS

Shure Brothers Inc., announced that its **Automatic Microphone System** was used during the **Iran-Contra Hearings** for both the Senate and House of Representatives investigations. Two AMS Systems were used for each chamber's operations. Each system consisted of 35 Shure AMS26 microphones and five Shure AMS8000 mixers. According to Shure, "The AMS System was mandatory because of the large number of persons participating in the hearings. Open microphones would pick up far too much noise and the sound engineers could not anticipate who (out of 35 people) would be talking at any given time, making it impossible to adjust the volume level for different speakers" . . . The Shure AMS Systems were provided by **Associated Sound** of Newington, Virginia, and **Camera Mart** of NY, NY.

• • •

Got any news? Call (415) 726-2428 or E-Mail Herman-US. IMC 2560 or send press releases, photos, etc. to Sound Reinforcement News, Mix magazine, 2608 Ninth St., Berkeley, CA 94710.



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—FROM PAGE 143, HIATT

and Willie Mitchell who produced Al Green and Ann Peebles. I also like Tom Bell, Rodney Crowell and the late, great Lowell George.

Mix: What about engineers?

Hiatt: I have to say Larry Hirsch, who engineered *Bring the Family*. He's the most soulful engineer I've ever worked with. He knows how to make feelings resonate.

Mix: Which studios do you like working in?

Hiatt: I love Ocean Way, with its old rooms. We recorded and mixed the album in Studio 2, which is the small room. I also like a little studio they've put in the old Musicians Union hall in Nashville. Some guy bought the place and is fixing it up.

Mix: Why did you move to Nashville?

Hiatt: It wasn't a career move at all. My first wife died two years ago, and I just felt burned out on L.A. It turned out to be a good move for me, though.

Mix: What about film work? You've written for several movies in the past.

Any more film projects on the way?

Hiatt: It's an area I really enjoy working in, and I hope to expand it more in the future. You hear horror stories about musicians getting involved in "Hollywood," but it's always been a good experience for me. I wrote a song for *Cruisin'* directed by William Friedkin, and then I did three songs with Ry Cooder for his soundtracks for *Alamo Bay* and *The Border*, and then I wrote another song for *White Nights* directed by Taylor Hackford, who also just did *La Bamba*. I found Taylor to be very sympathetic to music, and he's a real fan himself. But right now, my biggest thrill is this song I've got in Dylan's new film, *Hearts of Fire*, directed by Richard Marquand. I'm just so pleased and proud to have one of my idols singing it. It's a high point of my career. And Eric Clapton plays guitar on it!

Mix: What about your future plans?

Hiatt: Well, on the film front, I'd love to score a picture some day; that's something I'm gradually aiming towards. As for touring this album, I just don't know. Usually I'm real anxious to get on the road, but this time I'm

going to take a wait-and-see attitude. It's worked out well so far on this project. Ideally I'd *love* to tour with the guys on the album, but the chances of that coming together are probably low, 'cause of everyone's commitments.

Mix: What about your next album—any thoughts?

Hiatt: Since *Family*, I've definitely gotten more of a direction in my head. I'd like to do an album of all my acoustic material, all the solo stuff I can do at McCabe's that never works with a band format. The other album I'm thinking about is a collection of all my favorite blues and R&B covers, which I'll call, *Something Borrowed, Something Blue*. I could never have done that when I was at Geffen, so I hope it all works out now I'm at A&M. If they can let Joe Jackson release an instrumental classical album, they should let me do that, don't you think? ■

"Count" Iain Blair, British writer, musician, and author, was an original cast member of the Rocky Horror Show and the film version for 20th Century Fox. He's currently writing screenplays in Los Angeles.



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Mixers pictured: 16.16.2 SII, 16.4.2 SIII, 16.4.2 S5



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STUDIOMASTER

the sound experience

World Radio History

Circle #124 on Reader Service Card

by Barry Fox

CD-I

A EUROPEAN VIEWPOINT

CD-I—CD-Interactive—comes with a tangled pedigree. The prime mover in the West has been Philips, inventor of the compact disc audio system. Preliminary standards for CD-I were jointly set by Philips and Sony, with the so-called Green Book, in February 1986. But the Philips Head Office in Eindhoven, Holland, had already—by November 1984—set up a corporate group, called Home Interactive Systems, with David Geest as chairman. The HIS brief was to look at the future potential of optical disc as an interactive medium.

With bitter experience of past mistakes, which left Laservision videodisc hardware sitting on European shop shelves because there was inadequate software support, Philips saw the need for the hand-in-glove development of both interactive hardware and software. Hence the tentacle-like spread of investment in CD-I which followed.

In North America, Magnavox created Philips Home Interactive Systems, with an office in Knoxville, Tennessee, to push hardware. In Europe Philips International, based in Eindhoven, has the New Media Systems Information Centre under Manager John Preston. In Japan, a joint venture with Kyocera spawned Japanese New Media Systems.

On the software front, PolyGram in London took the lead for Europe under chief executive officer Jan Timmer. He is now replaced by David Fine because Timmer has moved on to become CEO of the whole Consumer Electronics division of Philips in Eindhoven. In the meantime, PolyGram has farmed off optical disc production to PDO, the joint venture between Philips and Du Pont, with factories in Blackburn, England and Hanover, West Germany. Responsibility for CD-I software now rests with Euro-

pean Interactive Media, EIM, which is the sister to American Interactive Media in Los Angeles. EIM has been virtually a one-man team. The CEO is Byron Turner. I spoke recently to Turner, along with Jan Timmer before he left for Holland.

Recently, Timmer has been at the heart of the dispute over DAT. He believes that it may still not be too late for the hardware and software industries to get together and talk constructively, instead of fighting over the new medium which could be of potential value to everyone. Timmer cites CD-I and CDV as examples of how the hardware and software industries can cooperate. He points to the Chicago CDV launch and pre-launch meeting in Los Angeles when

It may still not be too late for the hardware and software industries to get together and talk constructively, instead of fighting over the new medium...

Power Station selects t.c.electronic installs 6 TC-2290 sampler/delays

"I love the sound, the ease of operation, and the complete control over all parameters. With the three modulation parameters, speed, depth and waveform on the front panel, and the special key functions to access software TC allows fine tuning of parameters that are predetermined in other units."

The combination of dynamic delay and pan modulation allow quite a variety of effects within a single processing device. TC was very smart about this. The 2290 does a lot more, and is more affordable than any other unit we've used."

Engineer Don Rodenbach

A demonstration model of the new TC 2290 was sent to Power Station by Martin Audio. The first engineer to use the 2290 was Don Rodenbach, who was so pleased with the sound, and features of the 2290, as well as "the clarity of the .32 samples," that he bought one for his own rack. His unit then started making the rounds of various sessions at Power Station. Today there are six TC 2290 units at Power Station and no waiting. Each unit has 32 second capability for sampling (and delay), can be locked in perfect synch with a second 2290 for stereo sampling (*The new stereo link update*), and has Sampling 2 software, along with "Fast Trigger," update.

Sampling 2 Features

- 1) Multi-layering of samples. Up to 16 samples on top of each other with no degradation of signal, into the same pre-set.
- 2) Fancy Dancing-samples triggering samples any order, or number, as many times as desired.
- 3) .32 second delay possibility
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- 5) Note counter for pitchshift of samples
- 6) 1 millisecond sample looping and sound on sound possible.

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The TC 2290 offers 2 bits more resolution, at a quarter the price of any truly competitive unit. TC's 18 bit resolution, 1 MegaHz sampling rate, and 20-20KHz bandwidth (rolling off at 33KHz even out to 32 seconds) make the TC 2290 a remarkable unit for sampling, multi-effect delays, and panning programs.

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INTERACTIVITY

each picture. So either you have to compress the data or do without full screen moving video."

One option, available with existing technology, is to confine the moving action to a part of the screen, in practice around one-tenth. It is essentially a window defined by one-third the height and one-third the width of the picture. This lets CD-I give genuinely moving video for a small vital area. It could be a human head or TV screen within the screen.

Preston acknowledges that the DVI approach is interesting but makes the point that even with the powerful compression algorithms used, DVI can still only give motion on 85% of the screen area.

"We can do something similar with CD-I in the future," he says. "The CD-I standard leaves room for it. But it depends on how much people are prepared to pay, how many CD-I systems we sell and so on. My estimate is that we are talking about five years from now."

The other motion option, already available, is to reduce resolution of the picture. This gives a coarse mosaic image, rather like a pop music video special effect. There could be full screen motion, with a crystalline picture.

Eindhoven engineers are also looking at multi-planar reproduction, of natural pictures and graphics. The 175 kbyte/second data rate lets CD-I display one full quality full screen still picture every two-thirds of a second ($100/175=0.6$). This picture can form a backdrop for front animation, like the old Disney multi-plane camera technique. So a slow sequence of natural still pictures could be overlaid with full-motion cartoon-style graphics.

Yet another possibility under investigation at Eindhoven is the combination of CD Video and CD-I. Because CDV capacity is so limited (only around five minutes moving video and digital sound on a 12cm, 5-inch disc) the plan is *not* to mix CDV and CD-I sequences on the same disc. Instead two discs will be used. These could be reproduced in tandem, by a double-deck CD player. Alternatively, the CD-I player can incorporate enough memory to store picture or data information from one disc after it is removed. Another disc is then loaded and the

stored information used or displayed along with pictures streaming in real time for the second disc.

If the CD-I player is a 5/8/12-inch Combi unit, with onboard (or outboard) CD-I decoder, the options for multi-disc display become wide and interesting.

I asked Turner and Timmer what kind of programs we could expect to see for CD-I. For obvious reasons, no one will be too specific, because no one in the CD-I business wants to give away too much to the competition in what could well turn out to be a highly competitive business. But Turner and Timmer give some interesting pointers to the future.

Turner suggests games, "but not like arcade games," says Timmer. "Video games have until now been anti-social. But CD-I is a much more social concept."

Both Timmer and Turner envision coffee table book programs, with pictures of paintings coming up on screen and the commentary explaining what is being shown.

"When you print a book, you immediately commit to one language, and one layout," says Timmer. "But

with CD-I you can add several alternative languages and flexible layout. You can browse by subject."

Turner suggests a CD-I disc on the NASA space program. You browse through, find a topic and watch animated sequences of how rockets work.

"Then there is do-it-yourself, with sound effects," he says. "And map guides. Not just maps of how to get somewhere, but how to find what you want, for instance a combination Michelin guide to restaurants with Michelin maps. You tell the system what kind of restaurant you are looking for and it tells you where it is and how to get there."

Timmer is particularly enthusiastic about the use of CD-I for education. "You can have all the books for one school course on a single disc," he explains. "Because there is a single CD-I standard, you have got one standard for homework. It's transportable education. A child can carry all his books back from school to home on a single disc." ■

London-based Barry Fox specializes in writing digital audio perspectives for leading European technical magazines.

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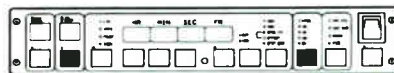
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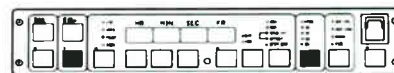
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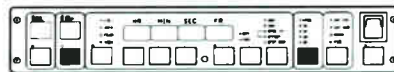
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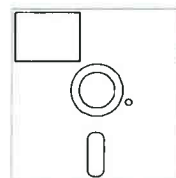
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HUGH MASEKELA & THE POWER OF MUSIC

by Josef Woodard

Hugh Masekela knows better than anyone that although music may not have the power to topple regimes or to pass legislation, given the proper atmosphere it can open minds and help to stimulate political consciousness. The seasoned South African musician fully believes in this notion, which some have shrugged off as failed dream of the '60s counterculture.

Can music—such as Masekela's "Bring Him Back Home," a plea for apartheid martyr Nelson Mandela's liberation—participate in the effecting of social change? "It can only participate in making those people aware who

might otherwise be just listening to an artist for entertainment and recreation," he comments. "If you can bring pleasure to them, then you should be able to gain access to their consciences as well. That's what that song is about."

Masekela's long-standing political advocacy and anti-apartheid sentiments have come out due to his increased public profile of late. Along with promoting *Tomorrow*, the recent album with his group Kalahari, Masekela took part in the acclaimed Paul Simon tour. Utilizing a rotating entourage of musicians—mostly from South Africa and including the players who graced Simon's *Graceland*—Simon's distinctive road show generated massive attention, as well as isolated fires of indignation from those who felt his politics weren't in the right place. On the whole, though, the tour served to concentrate a high degree of attention on South

Africa as both a wellspring of fresh music and a hot spot of social strife.

"It's all a matter of hope," Masekela ventures. "The album is based on

that; the title song goes in that direction. You usually hope that you can affect people a little bit, because they might affect other people and you could be in an influential position to affect certain things.

"Every effect is very temporary in a media-filled world; our attention

—CONTINUED ON PAGE 182

JERRY GOODMAN'S NEW OVERTURES

by Robin Tolleson

Fans of progressive music couldn't miss Jerry Goodman's picture on the Mahavishnu Orchestra's first records, his long hair, bare feet and patchwork

THE FAR SIDE

By GARY LARSON



Baryshnikov's ultimate nightmare

jeans in sharp contrast to John McLaughlin's European sophistication and Billy Cobham's urban cool. The Orchestra broadened the boundaries of jazz and rock in the 1970s, and Goodman's violin was a big part of that sound.

"A lot of people were out trying to emulate that band. And I really believe



ALEX DEGRASSI: LIFE AFTER WINDHAM HILL

by Derk Richardson

When Alex DeGrassi recorded his first album of solo acoustic guitar, he hardly expected to find himself on the cusp of the new age. "I wish the term had never come up," says the acclaimed six-string wizard. "People want to keep labeling things because it's a good way to position them in time and differentiate among different kinds of music. But it's very misleading and very confusing. People shouldn't make up their



mind about the merit of any particular music based on what category it's in. Music is a continual slop-

ping of ideas between this and that. That's how it grows and that's what makes it fun to keep playing. If the whole point is

—CONTINUED ON PAGE 188

that only a few bands were able to play that stuff and have it be honest," says Goodman. "The bands that followed picked up on all the bad habits that we had gotten into—high velocity, high volume, things I wish had been slightly toned down. They focused on those things, and it kind of gave fusion an erratic life, made it something different."

Orchestra alumni Narada Michael Walden, Billy Cobham, Jan Hammer and others have gone on to achieve high profiles in music, but Jerry Goodman virtually disappeared from

—CONTINUED ON PAGE 185



BODEANS' SECOND LP TAKES SHAPE

by Gregory A. DeTogne

A little over a year ago, the BoDeans' first album, *Love & Hope & Sex & Dreams*, pole-vaulted the Waukesha, Wisconsin-based band into the national limelight almost overnight, earning them a reputation as a musical force inspired by their own distinctly individual visions. Ostensibly,

—CONTINUED ON NEXT PAGE

The BoDeans from left to right: Guy Hoffman, Bob Griffin, Sammy Llanas and Kurt Neumann.

—FROM PAGE 179, *BODEANS*

the quartet consists of the four BoDean "brothers," Sammy, Beau, Guy and Bob (a.k.a. Sammy Llanas, Kurt Neumann, Guy Hoffman and Bob Griffin). The BoDeans' two frontmen and major songwriting forces, Llanas and Neumann, first crossed paths in junior high school nearly a decade ago. Working as a duo, they began to forge what would soon become the BoDean style. With the addition of drummer Guy Hoffman and bassist Bob Griffin, the group gained attention on the Milwaukee-area club circuit that eventually grabbed national press and a resulting record deal.

Recorded in Los Angeles late in 1985 with the able assistance of T-Bone Burnett's production talents, *Love & Hope & Sex & Dreams* is an amalgam of searching ballads and hard-driving, roots-oriented rock. Scaled-down and powerful instrumentation complemented their straight-forward lyrics to form tracks that each contained a hook listeners could instantly grab onto.

"Since the first record was done so quickly—we went into the studio and played live with just what we had on hand—people assumed we were nothing more than a roots-rock guitar band," Neumann recalls. "Our second album will probably shock quite a few of those who have followed us, because it is a departure. There are quite a few interesting sounds you wouldn't expect."

The BoDeans came across the proper combination of setting and technology right in their own backyard at Royal Recorders in Lake Geneva, Wisconsin. Jerry Harrison (of Talking Heads fame), who had been showing interest in the project from the time of its inception at the BoDeans' private studio in Waukesha, was called in to produce. New York City's Jay Mark served as chief engineer.

"The first album got across the point that we are concerned about writing good songs and singing," Neumann says. "The second album will do the same thing, only this time the songs will be presented in a different way. If we would have had a keyboard player or a synthesizer during the sessions for the first album, we would have probably used them. Ever since Sammy and I have been writing songs together, we've realized that you can pre-

sent something in a million different ways. I think we should make use of everything that's out there, and not pin ourselves to one particular style."

In addition to synthesizers and drum machines, also new for the BoDeans on their second album was a heavy reliance upon digital recording. Although Neumann was skeptical of the medium at first because he anticipated a clinical sound inconsistent with what they were after, the end results did indeed provide what they were seeking thanks in part to Royal's eight newly acquired Focusrite I.S.A. 110 equalizers (manufactured by Rupert Neve). Outfitted with extremely high-grade transformers for line and microphone input as well as module output, the Focusrites were installed by Royal specifically to give their massive SSL the additional tonal sweetness and warmth made famous by Neve technology.

As of this writing, the second BoDeans album remains untitled. The tracks recorded at Royal are all strong, and stand on their own merit. One, Neumann's "The Ballad of Jenny Rae," drips with a backwoods Arkansas flavor, yet contains dark foreboding sounds produced by an Emulator.



Other songs are written in the familiar BoDeans style, but reflect the band's emergence into dimensions clearly apart from their debut LP.

The BoDeans' (moderate) commercial success has given Neumann the freedom to continue his work in virtually any place he chooses, but he remains convinced that southern Wisconsin affords him with one of the best creative environments. "Recording here at Royal Recorders is a total departure from working in L.A.," he says. "You don't have the record companies on your back, and each morning you don't wake up in some motel and drive down a smoggy and crowded freeway to a studio where there are more people all over the place. Royal's resort setting is relaxing, and the equipment rivals anything you could find anywhere else. If you can't do a great record here, you can't do a great record."

Finishing touches and final remixing were completed on the BoDeans' second LP at Royal Recorders in June. Between the time the album is completed and its release, the group plans to tour Europe and Australia, while a fall tour of the U.S. is expected. ■

A POUND OF CURE

by Dan Daley

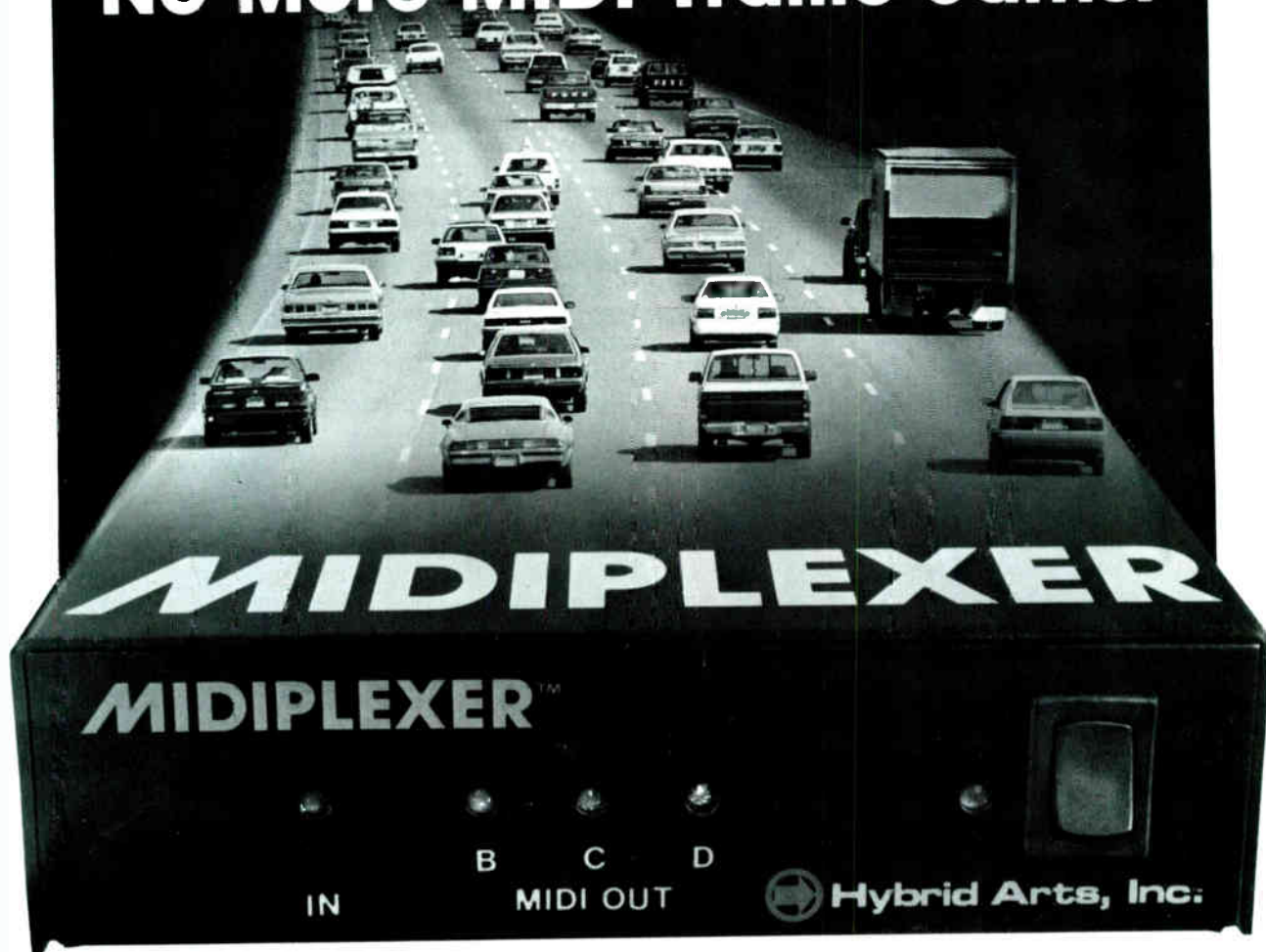
The fact that The Cure headlined New York's Madison Square Garden in August didn't seem to have sunk in with a lot of folks during the band's pre-tour interviews. "It's funny, I think," smiles Robert Smith, guitarist, singer and chief composer for the quintet. "I've been asked twice during interviews in the last two days who we're opening for."

The 29-year-old Englishman can take queries like that with a laugh: a few months earlier The Cure sold out the Los Angeles Forum in less than an hour, and on this tour they played *two* nights at the 14,000-seat venue.

In a little over a decade of various incarnations, Smith and The Cure have climbed out of the anonymous swirl of axe-to-grind/cross-to-bear British groups without the benefit of a "hit"

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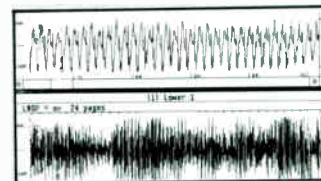


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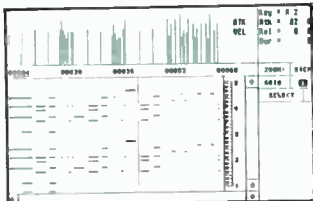


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single—nor any significant radio exposure in America, for that matter, even on stations with so-called progressive formats. College radio has made The Cure into a cult band that can fill 20,000-seaters virtually on a moment's notice.

The Cure's new release, *Kiss Me Kiss Me Kiss Me*, is an 18-song double LP with songs by Smith and, for the first time, by other Cure-ators. The band this time around includes bassist Simon Gallup, Lol Tolhurst on keys, drummer Boris Williams and Porl Thompson on guitar.

Sipping coffee, nursing a slight hangover and curled in a Bentwood chair in a hotel suite (rented expressly for the purpose of interviews; this band apparently knows how to have fun and the public relations person hastily acquired the suite after determining that their rooms too closely resembled Beirut on a bad day), Smith talks from beneath a rat's nest of black hair and through rouged lips of how *Kiss Me Kiss Me Kiss Me* came to be. In the course of compiling their previous LP, a singles collection titled *Standing on a Beach*, and writing the definitive biography of the band (the soon-to-be-published *Ten Imaginary Years*) Smith began to categorize the band's influences. "I popped a few beers and listened to everything we'd ever done and made mental notes. I was surprised by what I thought I liked, what I actually did like, and what I thought was bad," he says. "When we did the new record I remembered the bits I liked, and much of it wound up in there. And at the same time, there are a lot of styles we never really attempted before, like funk and Motown.

"It was supposed to just represent what the group can do at the moment. It doesn't really break any new group as such. It's not a definite step in a certain direction. I think of what we do as tangents from the same core."

What core? "My head," Smith laughs.

The Cure started with 100 songs, 25 of which were demoed at Beethoven Studio in London. These they took to Miraval Studios in Provence, in the south of France, a studio chosen for its accommodations (they didn't want to record in the city), for its familiar SSL console, and because "the studio has its own vineyard, and you can drink as much of the wine as you want for free."

For ten weeks Smith and producer Dave Allen "interpreted" 18 of the original collection of tunes. A newfound sense of personal security allowed Smith to step back and let others write: "That accounts for some of the weird styles on the album," he explains. "Porl and Simon have introduced new aspects: Porl thinks Captain Beefheart's time signatures are normal, and Simon listens to pop and disco."

If *Standing on a Beach* was a retrospective, then *Kiss Me Kiss Me Kiss Me* is revisionist history, drawing on all the phases the band has endured and replete with acknowledgements to influences earlier than The Cure itself, such as the wah-wah pedal on "Hey You." "I hadn't ever used one on a record before," Smith remembers. "I wanted to have a guitar adventure. When I first started playing guitar, my brother bought me one because he wanted me to sound like Jimi Hendrix."

"How Beautiful You Are. . ." has its lyrics mixed in thickly with the music, but the line "This is why I hate you" sticks out like a stiletto. This sort of seething emotion is never far from the surface of a Cure song. "In the past I've used songs as exorcisms, almost," Smith muses. "They're therapy, sometimes, particularly performing them live—I don't know why. That's what motivated me to form the group in the first place: because I thought I was writing songs that other people should hear."

At this point The Cure's manager bursts into the room and presents Smith with a prototype of the tour's official T-shirt. It bears a likeness of Smith's boyish mug rendered in a sickly grey. "Lovely skin pallor there, wouldn't you say?" he asks, only half sarcastically. The incident provides some insight into The Cure's place in the business. Having learned not just to survive but to thrive on the periphery of mainstream music, The Cure has somehow dealt with an ironic problem of perception that keeps them off commercial stations even as they sell out major arenas. "I don't understand why we don't get played on the radio," Smith says. "I think it's because there's an aura around the band that we can't shake. They won't let us on British television because they think we're a punk group. It's kind of funny, actually; I take it as a compliment because most of the groups I like are on the periphery. You

can be good and be on the charts—I don't think the two are mutually exclusive—but it happens very rarely. And I don't want to be in competition with those bands on the charts. We'd lose.

"More people in America like Lionel Richie than like The Cure, and probably always will. It doesn't worry me. It *would* worry me if we were presenting a choice and no one knew it was there. Then it wouldn't be a choice at all. So we have to fight for a certain level of awareness. It's too easy to escape us. American radio thinks we're weird also. But that never changes anything we do. I'm still surprised we're as popular as we are. But the college stations always played us.

"We're a crusade, really. The way I look at it, I stand outside the group and ask myself, would I want to be me singing in The Cure? The answer is yes. I like The Cure and I like being in it. I've always been sure of that." ■

—FROM PAGE 178, HUGH MASAKELA

span is so short. I can have you crying on some issue today and tomorrow it could run into something that is like a new drug—forget unhappiness. It could be like falling in love with your TV set, a certain show or a basketball game. In a multi-media world, it's difficult to maintain people's attention for too long, so whatever attention they pay to whatever problems you want to have solved, you're grateful for what time they can give."

Masekela was speaking from his hotel room in Los Angeles, where Simon's revue had sold out several nights at the Universal Amphitheater. The itinerant lifestyle is nothing new for this veteran: "I've been on the road almost 30 years, and it's a way of life. It was nothing special to other people that worked in this business, like Duke Ellington or Louis Armstrong or contemporary groups. That's the way we work. When you practice your instrument as a kid, you know that you're working to travel a lot, because if you don't travel, you don't eat."

More so than any other trip, however, a political subcurrent marked this tour—a clear sense that the whole world was watching. Under these circumstances, Masekela was in no mood to discuss trumpet transducers or studio techniques. Particularly irksome to him this afternoon were the minor

infiltrations of controversy following the tour. To some anti-apartheid groups, Simon's willful location recording in Soweto and his use of South African musicians on *Graceland* was a violation of the general South African boycott among pop musicians.

"The controversy seems to be completely divorced from the group, emotionally," Masekela asserts. "It's a puzzle to us. The thing that's most important to us is that we're making very great music. The controversy, to me, is a lot of people who are sitting very comfortably, either in comfortable refuge or in penthouses and villas and beach houses, saying 'we are in solidarity in South Africa and this is how South Africans must behave' without consulting them."

The tour also afforded Masekela—an exile from his homeland since the '70s—reunion with musicians he's previously worked with or had contact with. "I'd not known the other musicians personally, but we'd known each other from records. We may be exiles, but we're spiritually at home, and we keep in touch throughout the years."

Also, among Simon's musical comrades was South African singer Miriam Makeba, who, like Masekela, hasn't had a history of political complacency. "Miriam Makeba is not only a pioneer, but on behalf of the nation, she spoke out," Masekela notes. "In 1962, she addressed the world from the front of the United Nations. She could not have done that if she did not have the faith that came from the talent which she got from the people."

"Today, I'm very happy to be with her and these musicians. South African musicians need to be able to perform for our music to develop, because it's oppressed in South Africa and unless these people come out like that, the intensity of the magic and the spectrum of our capabilities are never going to be known. That chance doesn't exist in South Africa. Everything must be done to make sure that this thing is not lost. Whenever it gets a chance, like it has on this tour, the impact on the world is unbelievable."

Masekela wonders if there was some hypocrisy among seemingly well-meaning peers in the music business. "People like Ray Charles or the O'Jays or George Benson, Chicago or Blood Sweat and Tears, Tina Turner, Millie Jackson, Rod Stewart, Elton John didn't have any business going to South Africa.

They claim ignorance more than anything. Paul doesn't claim ignorance. They were forgiven because they said 'sorry' and then they made a million bucks or more each, money that we as musicians in South Africa can't make in our own country.

"Paul took something of his own to South Africa and came out with a great collaboration. But when Paul's collaboration is construed and misinformed to the public as impeding our progress—when a situation like this helps to take that tension away from what's really wrong in South Africa—then I say we're in a trick bag here."

And much of that trick bag, ac-

ording to Masekela, is stuffed with the belated and misdirected conscience of the free world. "There is so much guilt about South Africa because people didn't do shit a long time ago and [now] they're embarrassed to see people throwing rocks at tanks. South Africans didn't expect any help from overseas, except maybe mealy-mouthed condemnations and overzealous acts of solidarity that are done so naively that it shows there's no consultation with the people they're trying to help.

"I think it's more comfortable to take a seat in the bleachers. The armchair spectator sport of today is South

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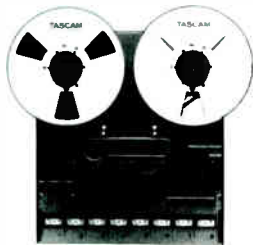
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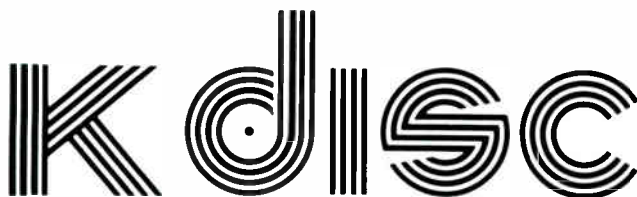
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MUSIC · NOTES

Africa. If you're at a party and you see a South African, you say 'gee, here's my chance to talk politics.' And if you see an Ethiopian, you say 'oh, here's my chance to talk about food.' Armchair people across the world can speculate and intellectually say 'poor natives, can't help themselves.'

"They're joining this thing a little too late. They're not even finding out what has happened. Some of us have been overseas for eight years talking about this, and there was a time when nobody wanted to hear it and a lot of the people who were overzealous about their newfound politics weren't even born when we were being ostracized. They never lived in the townships."

Masekela feels impelled to come to the defense of Simon. "One thing they've been shooting down about Paul's album is that it has no political content. There is nothing about South Africa that is not political, as far as I'm concerned. And when a person is moved by art, knowing the conditions and to actually go there and come out with something like this—which otherwise could never have been invented or promoted by the South African government or, for that matter, any of the people who are so forefront in the solidarity movement—to me that's a big political statement.

"The fact is that the man worked on it for two years and believed in it enough while people were trying to discourage it. He was moved and refused to perform in South Africa. And damn it, the guy took his own money there when others were pulling out money and saying 'we're sorry.' Not only that: I think rather than having a holier-than-thou stance, the man just went and did something."

There was a natural affiliation between Simon and Masekela, aside from the South African connection. Masekela first met Simon during his Garfunkel days; they shared the same producer and played at Monterey Pop together. And Masekela has long been a proponent of the blending of music cultures: "In the land of the dish and the Walkman, anybody who is still provincial is taking steps backward."

He lived by that policy from an early age. Fascinated with American jazz as well as the music of his native country, Masekela embarked for London and

Manhattan to study, broaden his musical horizons and play with western musicians. *Trumpet Africa*, his debut album, appeared in 1962, and the adaptation of a Zambian melody, "Grazing in the Grass," made an unexpectedly solid showing on the charts in 1967. His success in the west didn't strip him of roots, though: Masekela divided his time between the States and Africa. So along with duets with Herb Alpert, Masekela played with Nigerian Fela Kuti and, just last year, founded the Botswana International School of Music.

Maintaining an international, non-racial perspective is important to Masekela's world view and musical outlook. Did he, then, set out to fuse cross-cultural styles?

"Not so much new styles," he clarifies. "I just wanted access to whatever was there, and that involved not staying in South Africa. The scope that was set up for me in South Africa was unacceptable, in view of the people I idolized—like the Louis Armstrongs, the Duke Ellingtons, the Count Basies, the Clifford Browns or the Miles Davises. If I had the same kind of spirit and soul, then I wanted the same kind of access to the world. You can't limit

yourself in your lifetime.

"Fortunately, I come from a population that produces super musicians just latently. Of course, because we are an industrial country, we are exposed to the ways of the west. While they're exploiting us, because we are also a market, we have gramophones—turn-of-the-century dixieland and ragtime bands, swing bands with tuxedos. By the time I grew up, I knew where Charlie Parker's mother was born.

"People from South Africa can come to New York and tell you if you're lost, even though they've never been there. I've felt an affinity with the Afro-American population here because there's a parallel with our socio-political life."

Not unlike his one-time collaborator, Fela, Masekela has an acute political grasp and a sense of social urgency that carries beyond the interest of mere entertainment. This much is evident in an interview situation, where Masekela seizes the opportunity to get his message across.

"To a certain extent people don't listen. They just don't want to hear what you have to say. I was speaking to somebody in England this morning and they kept saying 'but...' I said

'there are no buts. I think I've laid my points down very clearly.'" He laughed, "If I was in politics, I might have lost my seat, but I'd have made my point very clearly." ■

—FROM PAGE 179, JERRY GOODMAN

the scene in the mid-'70s, resurfacing in 1985 with two records on Private Music, *On The Future of Aviation* and *Ariel*. He spent part of his off-time studying music and composing. "I decided to take a little break, and it turned into *quite* a break. It was a lot longer than I expected. It was fairly typical burnout. The Orchestra was on the road for what seemed to be endless periods of time. We never really toured the way tours are set up now. We just played everything that we could. About 180 nights a year, all one-nighters, all in strange places, bouncing all over the place. It made it difficult. I was in need of a rest at that time," says the violinist.

Goodman first performed with McLaughlin on the guitarist's *My Goals Beyond* in 1971, then with the Mahavishnu Orchestra on *Devotion, Between Nothingness and Eternity, Inner*

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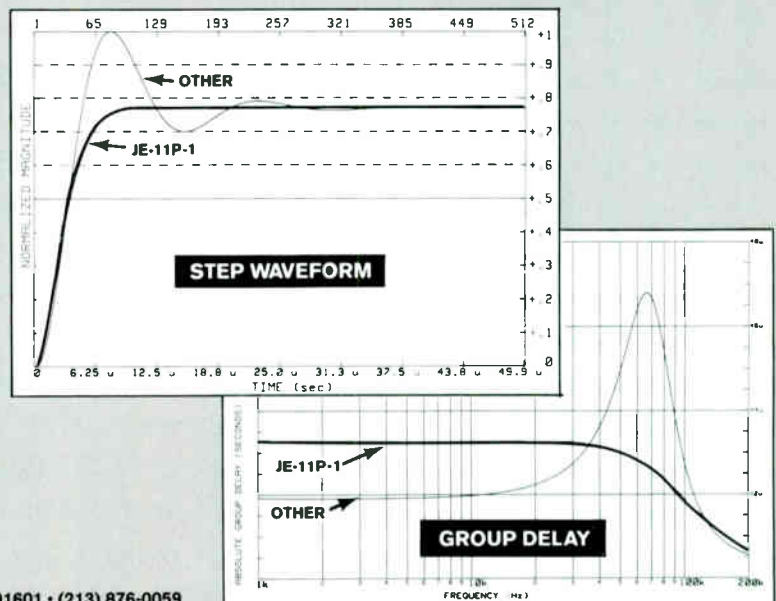
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MUSIC · NOTES

Mounting Flame and *Birds of Fire*. After appearing on Jan Hammer's *Like Children* in 1974, Goodman took his "break" from the business; aside from an appearance on Lenny White's *Big City* LP in 1977 and a few jingle dates around Chicago, he remained out of sight until his comeback in 1985.

When *On The Future of Aviation* was recorded that year, Goodman didn't have a set band. "I never intended to play that material live. It's more of an ambient thing, flowing and gentle. But I need the excitement of a band kicking." Conversely, Goodman composed *Ariel* expressly for the players in his band. The resulting musical brew skips across genres and from odd time to impossible. To some people, 15/8s, 17/8s and 9/8s are nothing to worry about. "To tell the truth, it's a struggle for me to stay away from that," says Goodman. "I'm trying to. I enjoy a little bit of the gymnastic stuff, but I've been trying to integrate something very simple on top of that so it remains interesting, yet understandable. A lot of the melodic statements I'm making are pretty straight-ahead. In a way I'm trying to create a certain balance between those two things. It's really not my intention to baffle people."

Goodman played in the Chicago progressive rock band Flock, releasing records in 1969 and '71 on CBS. "I started out as a roadie in the band, and became a guitar player," he laughs. "And shortly after I joined the band we started to integrate violin into the whole thing, and turned their music around quite a bit. I knew my way around the violin, actually a little bit better than guitar." Goodman had been classically trained on violin as a youngster, and both his parents built reputations in the Chicago area as violinists. His mother, Ruth, still tours with the Chicago Symphony. "It was a very logical thing for me to become a classical musician. But I started freaking out in my teens and decided I wanted to do something else," he admits. "My role models were basically typical guitar heroes, you know. That's what my soloing style was patterned after in the beginning. So if I did have any role models, they would have been Jimi (Hendrix) or Eric Clapton, people like that who I had been listening to on guitar. I think to a great extent my violin soloing to this day is very

much guitar-influenced."

He has the same musical ambidexterity when it comes to composition. "I sometimes will write based on violin-oriented styles. Most of the time I draw more from guitar in my composition than anything else. But I will create on guitar, violin or keyboard. I don't have a set pattern to my writing. I draw inspiration from whatever I can. It's a difficult way to work, but it can pay off."

The changes in Goodman's violin playing from the Mahavishnu Orchestra days seem to reflect a musical maturation. "In those days I was really bounding around quite a bit, looking, reaching a lot more for . . . I don't think I really knew what I wanted to do then. I was sort of groping. And I think now I'm trying to hone it in on some certain modal things, things that work better for me, that can convey more of my emotions."

Goodman's two solo albums were recorded at Studio Media in Evanston, Illinois, a studio he likes not just because it's close to his house. He leased a Mitsubishi digital recording deck and installed it at Studio Media for the sessions. "A lot of what I do is just laying overdubs on top of basics, and I don't really need an incredible amount of high-tech gear. Don't need automation that much. Studio Media is certainly not a state-of-the-art studio, but they've got everything it takes to make a good record." Both of Goodman's records have been engineered by Benj Kanters, who also mixes the group's live sound. Helping Kanters with the engineering on *Ariel* was Jeff Meyers.

Goodman enjoys working in the studio, putting parts down on his own when the rest of the band's not around. "There are certain things that can only be felt a certain way, and a lot of times I think that I have the feeling for these things and am able to get them across (in the studio), as long as they're not too difficult. It sometimes takes less time for me to do it than to convey the idea to someone else and have them do it."

Ariel doesn't feature the superstar musicians you're used to hearing Goodman with. The group he's picked is best known in the studios in Chicago, where they all are highly respected players. Jeffrey Vanston is Goodman's technical wizard on keyboards, while Fred Simon handles the more traditional keys. Drummer Jim Hines and

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bassist Bob Lizik are constantly working in the studios, as is guitarist Kraig McReary. The band toured Japan last summer, but their playing in this country has been limited by both the economic strain of the road and the fact the musicians are so busy playing in Chicago. "We opened for Human League for six dates, and just opened Stevie Ray Vaughan. It's interesting, trying to experiment with putting the band out there with different types of music. So far it's been real encouraging. Going to play in front of a straight-ahead rock guitar audience and have

them appreciate it, or a techno-pop band, and teenage girls with strange haircuts are into our music. That's nice." Goodman is used to unusual pairings from his Mahavishnu Orchestra days. "We'd get paired with just about everybody. We did one concert tour where we played with Blue Oyster Cult and The Byrds."

In his Orchestra days, the only electric violins Goodman could find were made by Barcus-Berry, but now he is happy with one made by Raad, of Toronto. "My equipment has changed quite a bit; however, it's a slow process for a string player. I've got to go out and experiment with gear that's aimed

at guitar players and hope I can get something to happen. In the past I would use these high-end guitar amplifiers, and now I'm more into a sort of hi-fi thing, with a very clean stereo system and a little rack of effects like everybody else. I use a Roland DEP 5 digital effects processor, which is a digital reverb, digital EQ and digital delay in one unit. And I'm using a JBL UREI amp. But I'm not locked into any of these things. I'm always experimenting, looking for stuff that will sound better." ■

—FROM PAGE 179, ALEX DEGRASSI

to sit there and get mellow, you can meditate on your own without music."

Earlier this year, after a long association with Windham Hill Records, DeGrassi recorded his first album for Novus/RCA, Steve Backer's ambitious label where new age "slops" over into everything from avant garde and mainstream jazz to high-tech pop. *Altiplano* is a function of DeGrassi's unwillingness to bliss out in a haze of good vibes or to coast on a mistaken new age identity. Not only does the album feature such additional instrumentation as acoustic and electric bass, drums, tabla, doumbek, violin, piano and synthesizers, but it shows DeGrassi extending his reach into the world of guitar synthesizers as well. "The whole world of MIDI instruments is changing so quickly," says DeGrassi, who has been woodshedding on an Ibanez guitar synthesizer, "that you buy something and play it for a while and keep your ears open and three months later something else comes out that may be more in line with what you need. I've been slow to pick up on that stuff because I've been an acoustic guitar player for so long, and I always will be. But I would like to think that I'm developing a larger palette."

The new album also reflects DeGrassi's growing interest in group dynamics. "I'm more interested in the kind of music you can write for a group," he explains. "In the last few years, I haven't written that much music for solo guitar because when I sit down to write, I think more in terms of music and not necessarily in terms of things that are idiomatic to solo guitar. When I started with the solo guitar thing, I just closed myself off in the world of solo guitar and when I sat down to write music I thought solely in that

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context. At some point I realized that I also wanted to write music that wasn't limited to the guitar."

These are significant changes for a musician who, for nearly a decade, has been known primarily as a solo acoustic guitarist, partly responsible for shaping what became known as the "Windham Hill sound." DeGrassi was never completely comfortable with that categorization, and that has a lot to do with why he left Windham Hill when the Novus opportunity arose. DeGrassi was one of the first artists to record on the then fledgling California label, and he was one of the most notable departures after Windham Hill had achieved worldwide success. His eclectic stylings derived from years of self-instruction and a wide-ranging taste that encompasses rock, jazz, blues and the fingerpicking styles of Bert Jansch, John Renbourn and Leo Kottke. "When Windham Hill started," he says, "the big question was what kind of music are you playing? We used to say, 'Well, I'm into a little of this and a little of that.' In fact, Windham Hill never really tried to actively pursue that new age label or use it to promote the music. What was unique

about Windham Hill was that it didn't fit into any categories. Sometimes I'd be called new age, folk, jazz, or folk-jazz. But I feel like I've been doing the same thing for years."

Born in Yokusuka, Japan, in 1952, DeGrassi has spent most of his life in the San Francisco Bay Area. At age eight he started playing trumpet, and he learned how to read music playing in school bands and orchestra. At 13 he took up guitar, and although he picked up pointers from a friend who was taking lessons, he has remained essentially self-taught. After a few jazz guitar lessons during college, DeGrassi dropped out of his formal training, academic and musical, and traveled in Europe. He strummed his guitar in subways, restaurants and folk clubs. When he returned to the U.S. in 1974, he played electric guitar in a rock-fusion band and went back to school. A degree in economic geography from the University of California at Berkeley proved to be less practical than DeGrassi had imagined, and it was while he was working as a carpenter that he recorded *Turning: Turning Back*, his first solo guitar album for Windham Hill. The label's founder, Will Acker-

man, is DeGrassi's cousin, and the family ties made it both natural for DeGrassi to remain with Windham Hill from 1978 through 1984 and quite difficult to leave.

"I was the first person after Will to record for the label," DeGrassi recalls. "We used to go out together and play gigs, and Windham Hill was primarily known for guitar players." The addition of pianist George Winston to the label put a new momentum into play. "I felt all through that phase that I was fairly involved in Windham Hill," DeGrassi explains. "But in the last couple of years I was feeling a little bit unhappy with my association with Windham Hill, I guess because there was a sense that the good old days were over."

The phenomenal success of Windham Hill brought unprecedented attention to the previously uncategorizable clutch of acoustic instrumentalists including Ackerman, DeGrassi, Winston, Liz Story and the Montreux Band. But it also subverted the early familial sense of well-being. "In the last couple of years," says DeGrassi, "I felt that our music had almost become known more for the label than for the individual artists on the label. The 'Windham

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MUSIC · NOTES

Hill Evenings' [occasional concerts featuring various artists from the stable] almost meant more to the general public than a concert with Darol Anger and Barbara Higbie, or Alex DeGrassi or whoever. I decided not to be on one of the 'Evenings' scheduled for Carnegie Hall; it was getting to be like 'Next up, number 14.' And still to this day I have people come up to me and say, 'I saw that Carnegie Hall show and I really enjoyed you.' When I say I wasn't there, they say, 'No, I'm sure you were there.'"

DeGrassi was widely acclaimed for

his rich, heavily arpeggiated guitar style and his unique tunings and original compositions. "But I was feeling a sort of genetic identity," he notes. "I felt like I couldn't go anywhere without talking almost exclusively about Windham Hill. I felt that Windham Hill was a great label but there's other music out there, too, and I wanted to enjoy what I do and what other people do without having my life totally tied up in this Windham Hill phenomenon. I felt that I was getting lost in something very big, especially when they were trying to sell it as a way of life. People were no longer getting to know me or what I was doing, they were

getting to know this big label, and I could be there or not and it almost wouldn't make a difference."

DeGrassi's last solo album for Windham Hill was issued in February of 1984. The guitarist spent most of that year and early 1985 on tour. In the late spring of '85, he developed tendonitis problems. "I was getting to the point where I could hardly play concerts," he explains. "I would run out of strength, I had no stamina in my hand, arm and shoulders, and I just couldn't play as well. I never had any problems before. It was a big shock to me, I didn't understand it." After a befittingly eclectic exploration of remedies, including sports medicine, chiropractors, deep tissue therapy, biofeedback, stretching, yoga postures, and diet adjustments, DeGrassi now estimates that he is 85% recovered from the condition that often affects musicians who overwork particular sets of muscles and joints.

The unexpected onset of tendonitis and the mild dissatisfaction with his place in the overarching Windham Hill scheme gave DeGrassi reason to pause and take stock of his career. "I guess like a lot of performers," he says, "when it's going well, you go more and more and more, but at some point you have to reflect on what you want to do next. You can't keep doing the same thing ten years in a row." The guitarist wanted to bring new influences into his music, so he cut down on his solo performances and began investigating different types of music. He played more classical guitar and delved further into jazz. In the Bay Area, DeGrassi collaborated in duos and trios with jazz guitarist Bruce Forman and flutist Larry Kassin. He worked on a soundtrack for a pilot television show and started checking into synthesizers—"doing those kinds of things," he says, "that one needs to do to regenerate enthusiasm and keep up with the music scene on a bigger scale."

When offered the chance to record for RCA, the decision to leave Windham Hill was very difficult for DeGrassi. "But it was important psychologically for me to do it," he says. He was able to continue working with producer Steve Miller, who had polished many Windham Hill sides into pristine beauty. More importantly, he had the opportunity to put himself forth with a singular identity. "The last thing I want to do is be on a label that looks like it's

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copying Windham Hill," DeGrassi explains. "Novus could be a great label if they just say it doesn't matter what category the music falls into." Although he knows it will take a while to "reposition" himself in the public eye, and for RCA to figure out how to reach the appropriate audience, he says, "When things are going well, it won't be lost at sea in a generic Windham Hill thing."

Before he recorded *Altiplano*, DeGrassi spent a month in 1986 with friends in Bolivia, on a trip that combined vacationing with amateur ethnomusicology. A fan of South American music, from the Andes to Brazil, Paraguay and Uruguay, DeGrassi didn't try to explicitly incorporate Latin music into his new album. "The culture and landscape of the Altiplano, of LaPaz, Lake Titicaca, and the ancient Inca empire, were more inspiration than the direct musical influences," he explains. Nonetheless, *Altiplano* shows DeGrassi reaching new heights in his internationally influenced music. More vibrant and visceral than most of what is considered new age, DeGrassi's music is created in the high plains of an imagination that is not easily saturated. "I look at the whole thing as a continual learning process," he says simply. "You never get good enough to where you can stop learning." ■

TOUR TECH: BOWIE'S GLASS SPIDER BAND

by Bill Milkowski

The 1987 Glass Spider Tour is off and running on a six-month, six-continent journey. It's a massive undertaking, involving two separate stage teams leaping from city to city, along with a small army of equipment roadies.

Bowie's soundman, Joe Wursing, has been meticulous about fielding quality equipment for the Glass Spider Tour. He's keen on the Yamaha Y-2 mixing console and is employing two of them. For the monitor system he's using two Harrison boards, one 32-channel and one 20-channel. And all the microphones are Sony wireless.

Outboard gear at the boards includes two Yamaha SPX90s, a Roland SDE-3000 digital delay, a Lexicon Su-



Carlos Alomar (above) is a veteran of several Bowie tours dating back ten years.

per Prime Time, a Publison Infernal Machine 90 echo/delay, two dbx 900 noise gates, a CMX-16 digital reverb, a Yamaha REV7 digital reverb, Aphex-2 Aural Exciter and five Dual DS-20 noise gates. The power amps are Crown D-75. And for taping the proceedings, he's using a Revox open reel deck, a Nakamichi BX 100 cassette recorder and a Beta Hi-fi.

The following is a breakdown of the players and their particular rigs:

• **Carlos Alomar/guitar**—An elaborate setup involving the Photon guitar-to-MIDI interface system. Carlos has a Photon pickup mounted on his Kramer American guitar, giving him MIDI access while allowing him the comfort of the guitar he knows and loves. As guitar tech Mark Sterling explains, "It's an infrared system that works with a light beam on the strings. The pickup shoots a laser light into the string so that as the string vibrates, it's modulating the laser. It reads the pitch of the string down to one cycle. It's incredi-

bly fast and there's no glitching or false triggering. That converts everything that he's playing to something that all the synthesizers can understand. And from there it goes into a MIDI thru box. And that way we can determine, depending on what tune he's playing, what synthesizers are getting information. And each string on the Photon guitar can be assigned to a different MIDI channel, with different octaves or harmonizations or whatever. It's an amazing system and I don't know of too many people using the Photon live."

During the course of the show, Carlos is triggering sounds from two Yamaha TX81Zs, a Roland Super JX, a Prophet VS, a Roland Super Jupiter, and an Akai S900 digital sampler. On a couple of tunes he'll use the Roland GR-707 guitar synthesizer. "Also," notes Sterling, "we'll be using a Macintosh Plus computer for massive filing for all the synthesizers and all the effects and everything, so we'll have a



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• **Erdal Kizilcay/keyboards**—"Erdal is an incredibly talented multi-instrumentalist," says roadie David Bonilla. "During the show he plays five keyboards, a viola that was made in the late 17th century, a clarinet, trumpet, trombone, congas and Simmons drums set on timbales. Plus, he sings. And he also brought three bass guitars and one Fender Stratocaster with him. So I'm going to be a very busy man just trying to keep up with him." Mostly, Kizilcay shares the keyboard duty with Richard Kottle, handling the more conventional piano sounds on the DX7 while Kottle concocts the wilder effects on synthesizers like the PPG Wave 2.3. Kizilcay's other keyboards include a Korg SG-1 and a Korg CS-70. His effects rack is basic—Ibanex digital reverb, mixer and power amp. "He's kind of a straight-ahead player," says Bonilla. "That's all he asks for, really."

• **Carmine Rojas/bass guitar**—Carmine uses an ESP Spector bass with a Yamaha wireless system. He has different basses pre-set to different tun-

ings. His amp is an Ibanez with 4x12 Electro-Voice speakers in custom-built cabinets.

• **Alan Childs/drummer**—He's triggering an Akai S900 off his Tama Art Star II acoustic kit, via XT triggers made by Mark Electronics placed on the tom toms only. There's a modified Shure SM57 microphone inside the snare and a Black Night pickup in the kick drum. The samples he's triggering are a blend of acoustic and electronic sounds, some of which were utilized on the latest Bowie record, *Never Let Me Down*.

• **Peter Frampton/guitarist**—Peter's guitars are custom built by John Suhr of Rudy's Music Stop in Manhattan. "Peter's got four of them at the moment," explains guitar roadie Chris Davis. "He's bringing two along on the tour and keeping two at home as insurance." He'll play them through a Nady 701 wireless system. His stereo amplification setup employs two 100-watt Marshall stacks and as a bonus he's got two extra Mesa/Boogie amps (a Mark III and a Coliseum 300) which he uses strictly for overdrive. "They're very expensive but fine-sounding fuzz boxes,"

laughs Davis.

Frampton's effects include a Yamaha SPX90, a T.C. Electronics 2290 dynamic digital delay/effects processor, Lexicon PCM70 digital effects processor, UREI 1176LN compressor and an Eventide Harmonizer. His two Marshall amps have been modified by pros—one by Jose Aridondo, who does similar work for Van Halen, and another by Henry Hee, who does Steve Stevens' Marshall customizing. And to cool out the roar from the overdrive amps, he uses a Rocktron Hush IIC.

• **Richard Kottle/keyboards**—He uses two Prophets for the warmer, smoother sounds, like violin. He has two DX7s to handle the standard sounds, and a PPG Wave 2.3 with Wave Term for wacky sounds. His effects include a Yamaha SPX90, a T.C. 1210 stereo chorus/flanger and a Yamaha REV7. Richard also gets to blow some saxophone during the show.

The entire Glass Spider Tour is well-equipped with Monster Cable. As soundman Wursing put it, "Everything has been rewired, even inside the amps. We have to make sure we're using the very best for this tour." ■

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World Radio History



NMDS
manager,
Yale
Evelev

NEW MUSIC DISTRIBUTION SERVICE—A GROWING ALTERNATIVE

by Josef Woodard

It's safe to say that the record industry is currently on a Bigness Binge, isolated indie success stories notwithstanding. New Music Distribution Service, born of frustration with the industry, is becoming a crucial vehicle for presenting and promoting modern music for which the majors have no time. As its cache of different labels (all in varying sizes of *small*) has swollen to more than 400, NMDS has cultivated a fiercely devoted following sufficient to keep the cause alive, if not entirely prosperous.

NMDS provides an invaluable service to the aesthetic fringes of American music, that vaguely defined area called "new music"—encompassing the modern classical strains of minimalism, sound artists, avant-garde jazz, outer-limits rockers and a melange of other types which don't slip easily into any niche. NMDS is a mail-order mecca and a switchboard for the creative underground.

For the makers of the 2,000 or so titles available through NMDS, profit margin isn't the central issue. Still, a number of former NMDS artists—including Laurie Anderson, Philip Glass and Steve Tibbetts—have gone on to major labels and have spread their experimental gospel among a widening audience. NMDS also has been the stage for success stories of driven artists who have ventured into broad acceptance from out of the blue; manager Yale Evelev sums up the organization's function when he says with a wry grin, "We *are* the blue."

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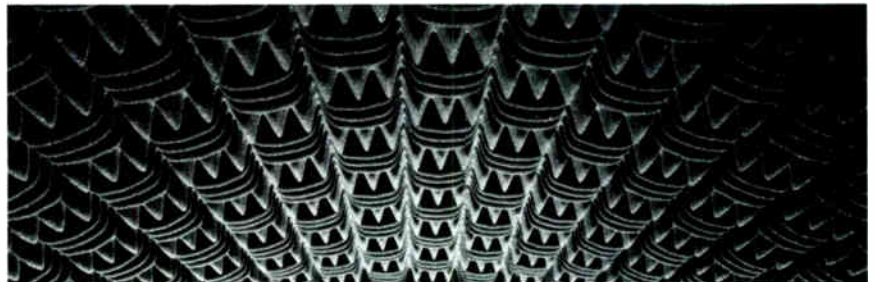
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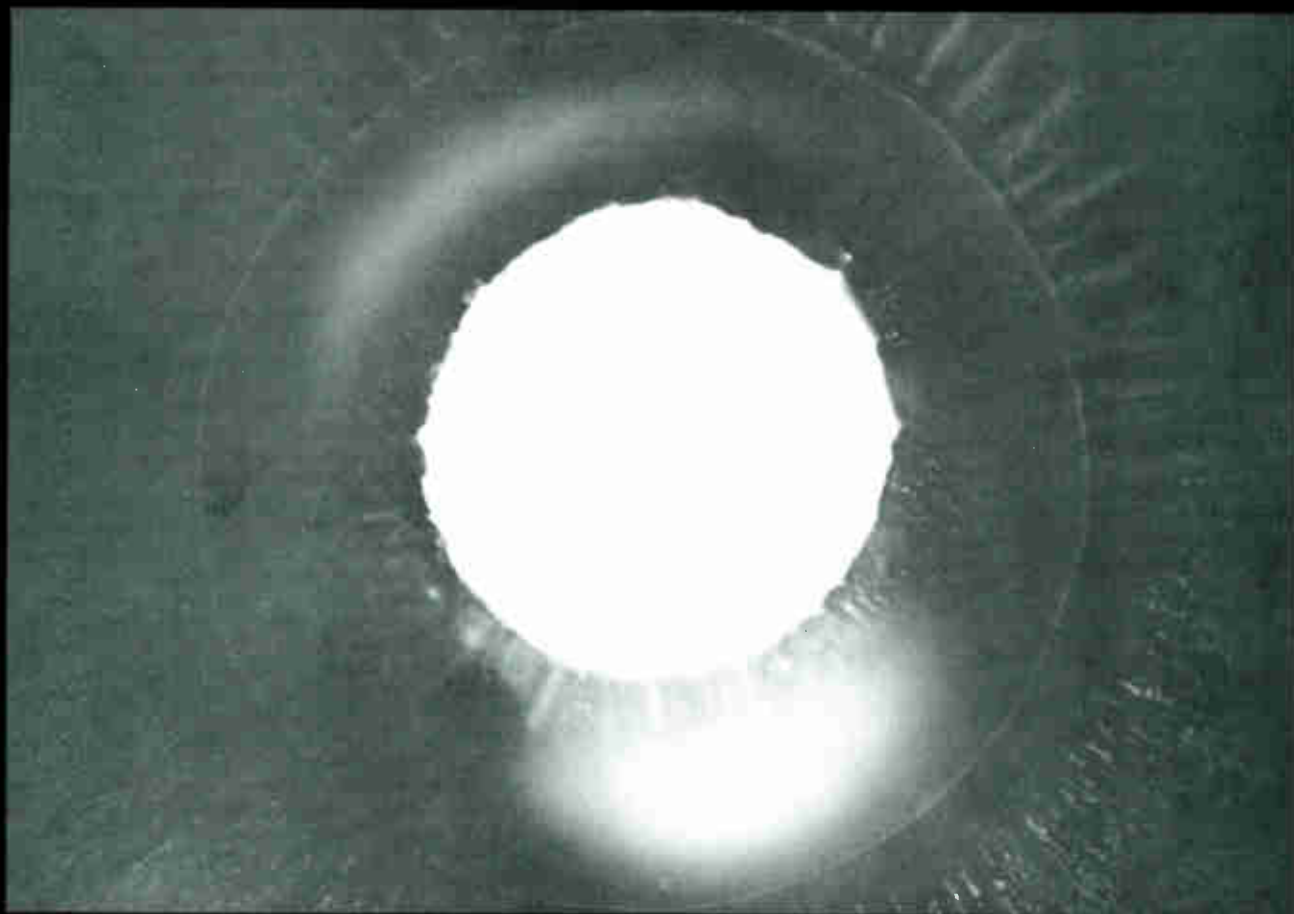
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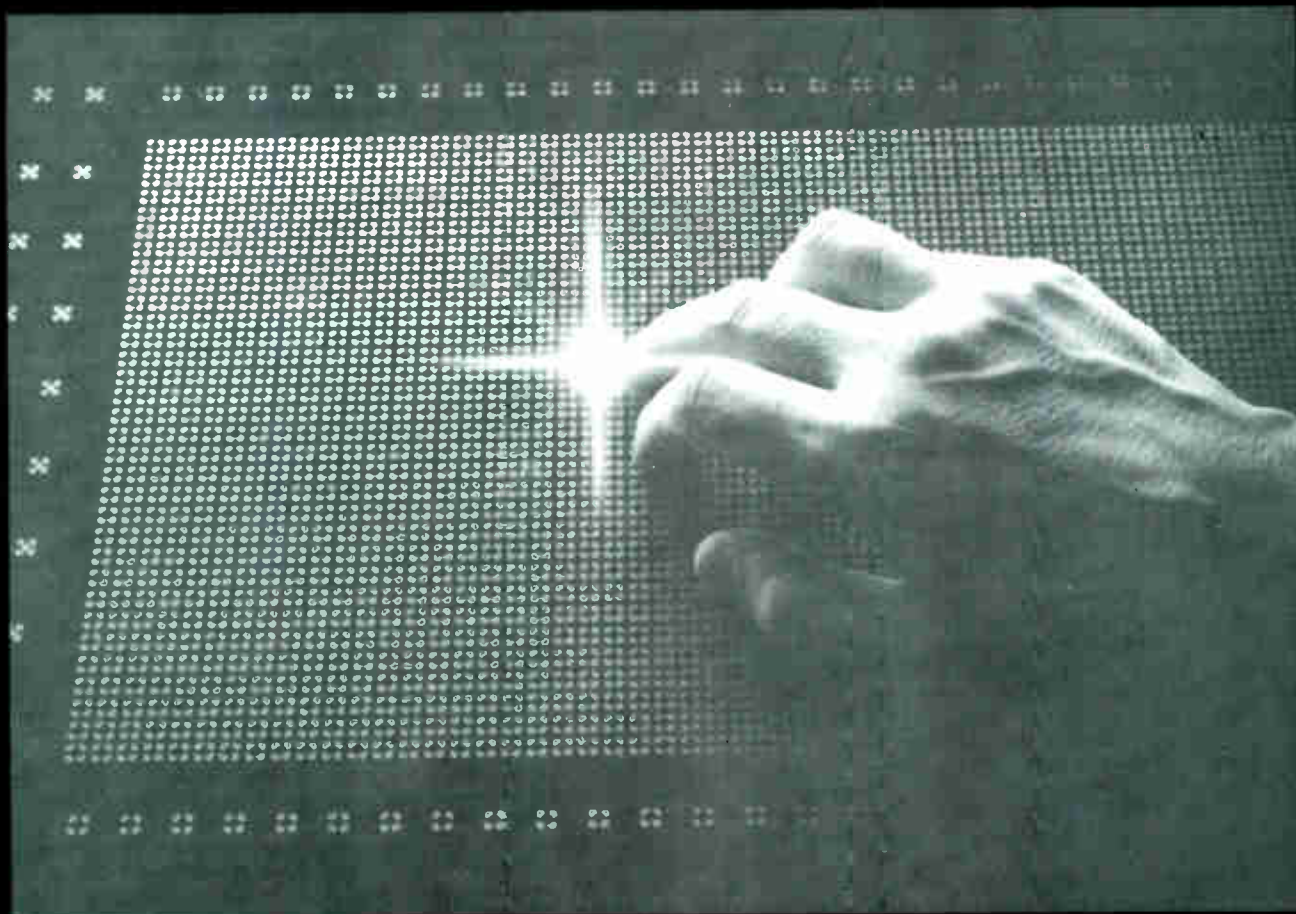
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to its ideals for over 12 years now, operating out of a large room on an upper floor at 500 Broadway in New York's SoHo. There, the sheer concentration of hard-to-find records is a bit overwhelming. Most of the nation's left-of-center jazz records pass through here on labels such as Moers Music, India Navigation, Hat Hut, Nine Winds, etc. Established entities share the shelves with modest avant-garde labels, some of which have only a single release.

A sort of defiant determination underlies the enterprise, and there is none so strongly self-reliant as Carla Bley, who, along with her husband Michael Mantler, launched the service in the late '60s (they named it NMDS in 1972). Bley decided to take matters into her own hands after one too many rejections from existing record labels. Getting her music into the marketplace, she says, was like "trying to cut the lawn with a backhoe."

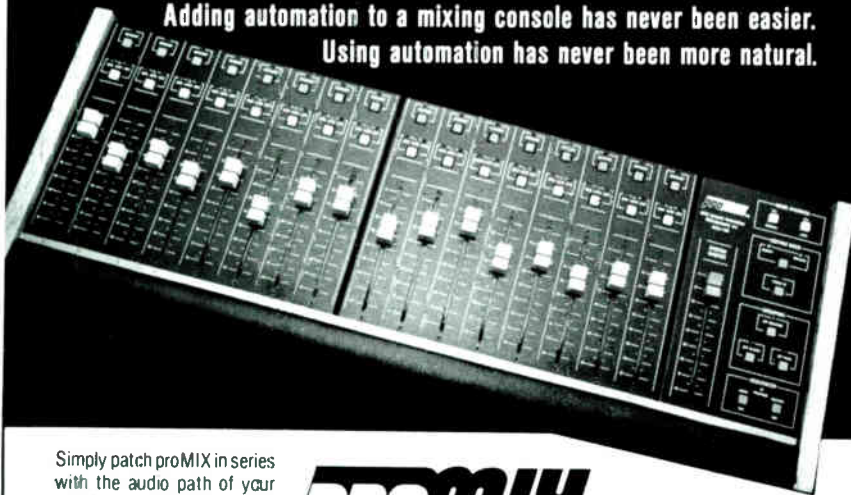
Thus was born the Jazz Composers' Orchestra, an organization loosely encompassing a circle of jazz musicians realizing the ambitious, large-scale works devised by Bley and Mantler. Releasing an album on the newly christened JCOA Records in 1968, Bley and company slid effortlessly into the more responsive arenas of Japan and Europe but had a hard time in the home of the brave. Positive feedback from the press and word-of-mouth led to another album, the three-record epic *Escalator Over the Hill*, in 1972. Having rallied up the funding through numerous loans, the musicians had to devise a realistic distribution program.

Enter NMDS. Moving into a building across the hall from the Center for New Music, the independent, non-profit distribution idea took hold. (Sympathetic volunteers ran the operation at first; NMDS now has six employees.) Evelev recalls, "The original intent was just to be a jazz distributor. It grew into this other thing because people liked Philip Glass, and those kinds of artists didn't have a place to take their records, either. Michael and Carla felt, 'Well, this really is new and happening music also. Jazz is not the only thing happening at this point. We'll take some of this, too.'"

Evelev reports that the growth rate of new labels joining the service is about 30 to 40 a year, with a slow

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attrition rate of artists and labels bowing out. As more disenfranchised and/or disgruntled artists approach NMDS, the problem of narrowing the aesthetic definition of acceptable music idioms—a screening process—arises. Basically, it is a haven for music with nowhere else to turn.

While there is some effort to assert a consistent filtering code and maintain artistic continuity across the NMDS catalog, the boundaries aren't hard and fast. "There are a lot of grey zones. For instance, we try not to carry George Winston-type stuff—new age records," says Evelev. "And we didn't have any rock until 1979. People thought we should carry The Residents, so we did. We do take things that fit into our niche. Flipper, for instance, fits. Another aspect of the rock issue is that you find new wave groups have other distribution and when you try to sell records, you just come up against other distributors. New wave groups don't need you as much, whereas with new music or jazz, people might have given records to other distributors who just don't know what to do with them. We'll end up selling quite a bit, because people who are attuned to what we're doing expect that from us."

A chart-busting platter at NMDS sells in the neighborhood of 25,000 units—relatively modest stakes, but the allegiance (within and from the eventual audience) is impressive. Evelev is up front about the financial prospects. "We lose about \$30,000 a year," he shrugs. "Not too good. It goes up and down. We get some grants [notably a stipend from the Ford Foundation], and mostly we pay people very slowly. That's what ends up happening. The record labels understand—most of them. They realize that we're not going to go out of business and we're not dishonest.

"However," Evelev continues, "the more labels we take, the more money we lose, so we try to have some sort of limit." Due to the fluctuation of the dollar around the globe (and other obstacles), most NMDS labels are of American origin—although the European market for small, adventurous labels runs high. The European labels represented tend to specialize in American music, mostly jazz, their sights set on the promotion of America's musical wildcards.

"Another thing we do is advise people on putting out records—where to

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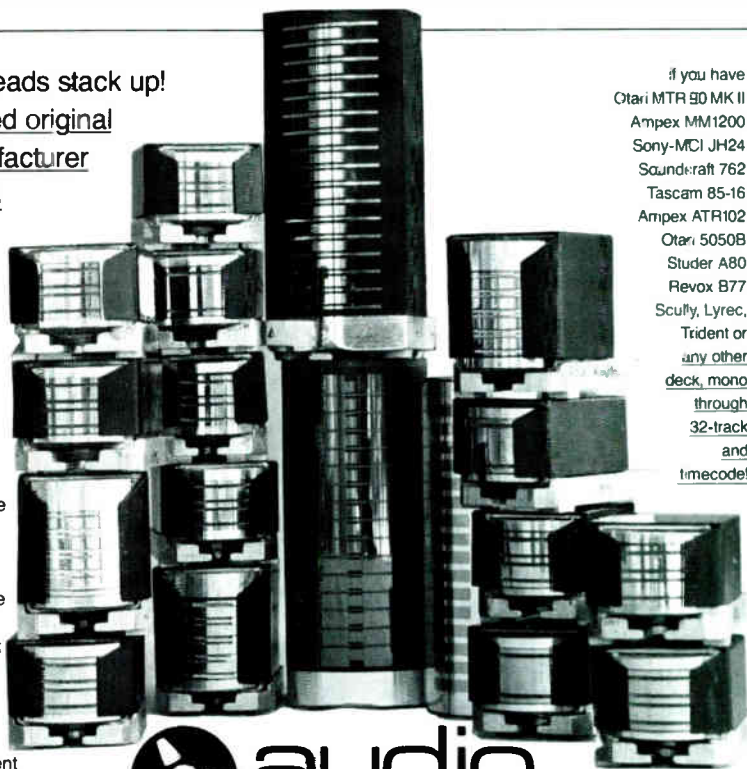
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go to record, good places for pressing. Everybody should start a label!" Evelev exclaims; in fact, Evelev's own Icon label was picked up for national distribution by the prestigious Nonesuch label. Among his projects have been records by Daniel Lentz, the Javanese "pop" group Group Gapura and an elaborate setting of music by Ennio (*The Good, the Bad and the Ugly*) Morricone by John Zorn. But it was no easy feat for Evelev to launch Icon. "I should know enough *not* to do it. You need the funding to start, and then you have to figure how to issue records and get money back quick enough, or spend little enough so that you can issue more records, and that's always been a problem. Any time you have a successful record, you're going to strain your resources; you'll never have enough money to keep it in print be-

cause the money won't come back quick enough. If you have an unsuccessful record, then you have a problem too, because you have all these records lying around and no one's paying for them. So you've got to hit this middle ground, a weird way of looking at things."

One unique side effect of NMDS's continued, albeit modest, success is that its very existence serves as encouragement to outcast musicians whose chances in a conservative record industry are next to nil. "When it started, there weren't many musicians making their own records," Evelev reports. "We showed that if you can make your own record and there's a place to take it, it doesn't have to sit in your living room propping up your coffee table. You can take it here; we'll send it out to stores, to press people, to radio people, try and promote it in some limited way and try and help you sell the

records."

In essence, NMDS has helped generate a Warholian utopia: everyone, once authorized, has a shot at 15-minute celebrity. In addition, NMDS has admirably bucked the monolithic record industry and shown that independence and artistic self-sufficiency are possible.

Carla Bley writes: "Until the recent unruly springing up of musicians' labels began in defense (against corporate impenetrability), the selection of interesting new music available to the listener was limited by a scandalous set of rules... better suited for raising poultry, these standards were responsible for practically annihilating an already endangered species—the creative musician."

(For further information and a catalog, write to New Music Distribution Service, 500 Broadway, New York, NY 10012, or call (212) 925-2121.) ■

—FROM PAGE 44, ANALOG ELECTRONICS

we can conclude that the trailing edge(s) of the record head gap(s) are not in perfect vertical alignment. This may be caused by gap scatter or gap width differentials that are symmetrical about the gap center-line. Gap scatter is easily identified in playback, whereas varying gap width is not. The net result is that the optimization of the record process may be at the expense of sync reproduction, and vice versa.

Distortion vs Levels: The amount

of bias current that is applied to the record head will affect distortion, high frequency response, "biased tape noise" and recording sensitivity. Many assume that these characteristics are tied together and that setting the bias current for minimum biased tape noise puts you at minimum distortion, and near maximum record sensitivity. This is not so—it only will put you at the operating point of minimum bias tape noise. The formulations of various tapes often cause the minimum noise

point and the minimum distortion points to overlap at the same bias current, but you can't take it for granted.

Examination of each parameter affected by bias current, as specified on the manufacturers' data sheets, provides a much clearer picture, hopefully. Something missing on most spec sheets is the variability of bias current for minimum distortion vs operating level, and the effects of "self-bias." This phenomenon has been studied recently^{5,6,7} and has resulted in products that appear mostly in cassette and home equipment, such as the Dolby™ HX system. Applying this to professional recorders requires looking at the study that was done by T. Staros of MCI⁸ and relating his curves (See Fig. 11) to your operating level.

Bear in mind that music has a dynamic envelope that the VU meter does not see. If we are operating at "+6," then we have to assume that most of our signal content will actually have a flux density of anywhere from 370 to 1,100 nW/m². We therefore would like our minimum distortion point to be about 3 dB above our chosen test tape and sine wave operating point. Generally this falls at around 3 dB over, at 10 kHz at 15 ips. By the way, the over-bias point is wavelength-sensitive, therefore it is very important to note that 3 dB over at 10 kHz at 15 ips is not the same bias point as 3 over at 30. It is much closer to 1½ over.

Bias symmetry (or lack thereof) is

Why EQ Curves Look the Way They Do

Most of the time, when we see the response of the reproduce section of a tape recorder illustrated graphically, as in the case of test tape curves, or in the back pages of the service manual, these curves look like those in Fig. 7.

What you are seeing in these curves is what response would be if there were a constant flux of changing frequency present in an ideal reproduce head. However, if you disconnect the head and attach a signal generator that has a constant output and sweep it, you will see a curve similar to the one in Fig. 8. This is due to the rising 6 dB/oct. curve mentioned in the accompanying article. Since all magnetic repro-

duction systems exhibit this basic curve, it is assumed in all literature and equalization discussions. It seems obvious now, but how many of us believed that the low frequency EQ differences between CCIR and NAB were in fact a low frequency roll off in NAB that requires a boost in recording?

Recording curves do not exhibit the inverse of the 6 dB/oct. response. In fact, there is only a slight rise in the high end and low end, (for the NAB curve), on the order of +2 at 10 kHz and +5 at 40 Hz. Whenever we look at reproduce equalization curves, unless it is otherwise stipulated, assume that the curve is the result of the difference between a falling 6 dB/octave line and the result of the equalization.

—G.H.



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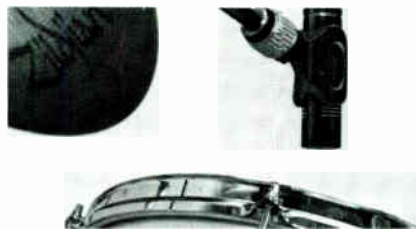
Percussive attacks test the entire system's transient response. Like several Beyer Percussion Mics, the M 422 has a small diaphragm for the



instantaneous response that produces a crisp, well-defined sound.

Control

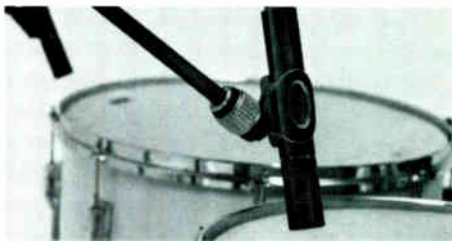
Isolation of individual drums and cymbals is critical when a variety of microphones are used on the drum set. Beyer Percussion Mics such



as the M 420 have tightly controlled polar patterns. The 'top of the set' snare and tom mics also employ a precisely tailored frequency response to minimize leakage from the bass drum and floor toms.

Character

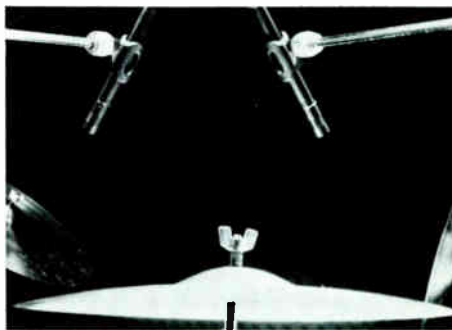
More than any other factor, it's what sets acoustic drums (and drummers) apart from the crowd. Beyer Percussion Mics like the



M 201 combine carefully regulated proximity effects with precisely controlled polar patterns. By varying placement and distance, you can capture each drum's character and personalize the player's sound.

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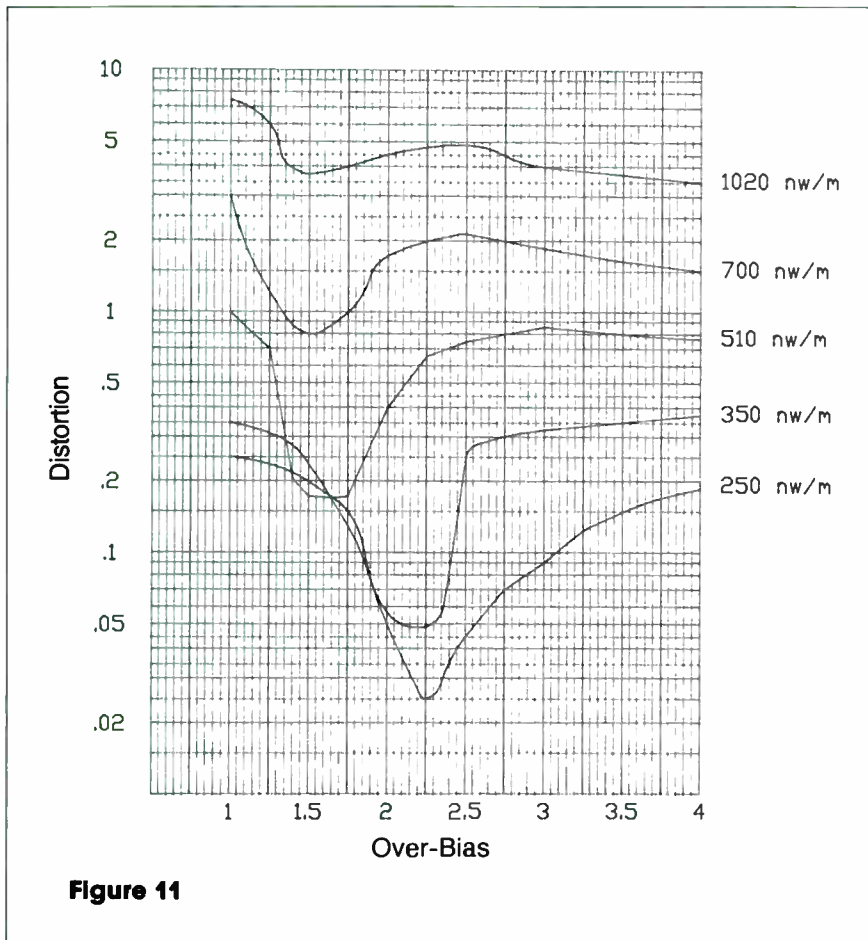


Figure 11

tremely thin laminations, and the entire ferrite family, exhibit very low eddy current loss. This has enabled modern recorders to utilize bias frequencies of up to 500 kHz, with 240 kHz being quite common. The frequency of the erase signal, on the other hand, is kept much lower. We desire a frequency which will have negligible eddy current loss and a stable permeability with a consistent inductance. Most newer designs incorporate a divider in the master bias oscillator section to achieve an erase signal that is $\frac{1}{3}$ or $\frac{1}{4}$ of the bias frequency.

We need to develop some significant erase current to fully erase a track on a multi-track machine, and we are constrained by the amount of area that we have available to us to accomplish that task. Modern erase heads are built in a checkerboard type of pattern to allow for extra area in which to wind the wire and house the pole pieces. This has given us levels of erase previously unobtainable with conventional "inline" erase heads. Incorporated in almost all erase heads are multiple gaps which, in effect, erase the signal twice.

When we align the erase drivers, we want as much signal as possible to get to the head, without saturating the pole pieces or clipping the driver amplifier. Care must be taken with some of the checkerboard type heads because early versions did not include a guard band between vertically adjacent tracks, which can result in transformer coupling of the erase signal to the winding(s) of the tracks above and below the track that is in record. This results in partial erasure of the high frequency signal on the tracks that are two tracks above and two tracks below a track that is in record. See **Fig. 10** for a graphic illustration of what I'm trying to relate.

Another concern to be aware of when doing the erase alignments is heat. Most modern erase heads require the presence of tape on the front of the head while it is energized, because the head utilizes the tape as a "heat sink" to help keep the internal temperature of the pole pieces within operational limits. If the head gets too warm, the inductance of the pole pieces shifts. As almost all recorders are designed to resonate the erase head for maximum signal, when the inductance changes, so does its resonant frequency. This can result in an alignment that is incorrect for the

something that is rarely mentioned but often causes grief. Distortion in the bias waveform is not a bad thing in itself, because the bias waveform is not reproduced. However, any even order harmonic distortion results in the recording of "random" noise. When there is any non-symmetry in the signal, the even order distortion products yield the equivalent of a DC signal that will offset the reproduced zero axis. This means that all drop-outs and surface irregularities become modulation elements resulting in "popcorn" and "bias rock." We often see the same result with a magnetized erase head. (The *cogniscenti* in my audience are familiar with the sound, and it is not pleasant.)

Symmetry problems are most often traced to problems with electronic clipping or magnetic saturation. In almost all newer tape recorders, there exists some form of adjustment to care for (or cause) this problem. The various stages that require inspection, correction and alignment are: master oscillator, master bias bus, master erase bus, individual channel bias outputs and individual channel erase outputs.

An oscilloscope is necessary for all

of this work, as is a low capacitance probe. The specifics vary from machine to machine, but the concept remains the same. We must insure that the bias and erase signal(s) that are getting to the head are as free of even order distortion as possible.

While we're on the subject of saturation, it is a good time to discuss bias and erase frequency. We need the bias signal to be at least five times greater than the highest audio frequency of interest. This is obvious, for any fifth order harmonic of the highest frequency will produce a beat frequency with the bias signal, and this beat product will become an integral part of our recorded signal. Whistles do not agree with flutes or drums. In practice, this has resulted in most machines using a frequency of 120 kHz or greater. The higher the bias frequency, the higher the audio frequency response can extend.

There are practical limits on how high we can get the bias frequency, and one of them is eddy current. Eddy current losses result in heat, which lowers the permeability of the head resulting in lowered magnetic efficiency. Newer head designs using ex-

—FROM PAGE 37, MAINTENANCE EXPERTS

ment should be cool and dry, around 40% relative humidity. The deck should be on all the time. The danger in this would be AC power line disturbances caused by the electric company or heavy loads from nearby industrial facilities, but you should have a line monitor/conditioner on the power supply line, because in one fell swoop, much damage can be incurred.

Forman/Tekcom: Starting out with a properly aligned tape deck ensures that you won't have to relap or replace the heads prematurely. If the studio doesn't have a maintenance tech who does daily alignment and calibration, they should purchase a series of alignment tapes so they can check that and do any minor level adjustments needed to keep it running properly. If it's a 4- or 8-track format, check the alignment every week or two. If it's a larger format being used heavily, check it on a daily basis.

standard operation of the machine.

As can readily be observed from the preceding, it is a wonder that we get audio on and off tape at all, let alone as well as we do. It is a tribute to the art and skill of the design engineers of today's recording equipment that we obtain, in the analog realm, results that can be so artistically satisfying. I hope that this article has armed you with a few tools with which you can optimize your recording system, and give continued life to the analog recording domain. Happy tweaking! ■

Formerly chief engineer at Wally Heider Studios (L.A. and SF) and technical director of Audiotechniques, Greg Hanks now heads New York Technical Support.

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- ⁵ Sakamoto and Kogure, AES 61st Convention.
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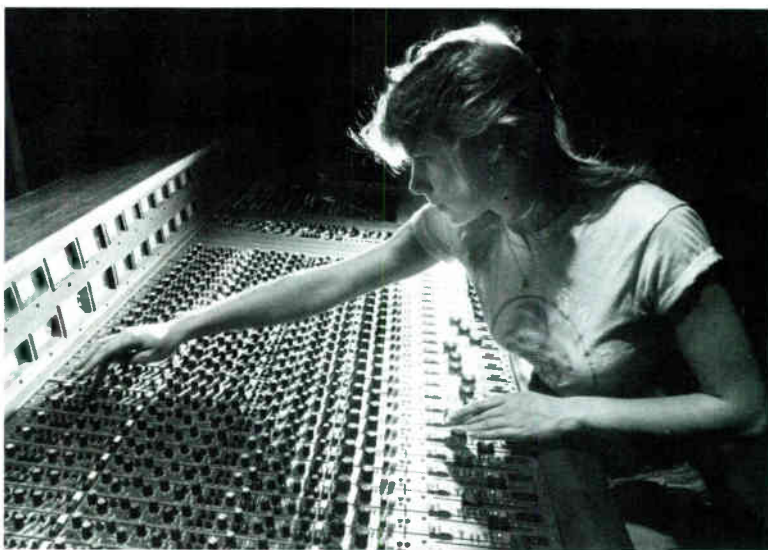
Garrett/Studioworks: I always suggest that all new machines be used for about a month, to let the electronics settle down and stabilize. Tweak it whenever you want, then after that, it's starting to stable out, it holds its setting, *then* you align it. After that, every day the engineer should clean the machine, demagnetize it, tweak it up; but *learn* about it before diving in. Keep the service manual handy, along with service bulletins, and any spare parts necessary to keep it running — silly little things that cost three, four dollars. Voltage regula-

tors, pinch rollers, lightbulbs, springs, small items that can put the whole thing out of commission. And keep track of how much time you have on a pinch roller.

Once a month or every two months, clean the relays and belts. Keep every connection and switch contact as clean as possible. Many machines have edge connectors that are *always* going bad, so keep a pencil eraser handy to shine 'em up. Cramolin is a product that's good to put on all edge connectors, contacts, anything else you can get.

—CONTINUED ON PAGE 204

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Budd/ICB Audio: You've got to know your machine. In this part of the country, where machines generally are older, it's important to keep their contacts and connectors clean. Many problems develop due to oxidation, so environmental cleanliness in the control room and a good air conditioning system are important, as well as exterior maintenance of the machine. Dust and humidity really attack them. With some machines, it's necessary to regularly pull out the cards and thoroughly clean every contact, but I don't recommend that on a machine that's working fine. If it's working, don't interfere with it, because that can cause more problems.

In addition, you must adjust tension correctly. If too high, it can cause excessive wear on components. Basic mechanical transport alignment will help preserve and elongate the life of the components.

Delany/E.A.R.: Primarily, put the proper cleaning solutions on the proper parts. Non-freon-based things on rubber immediately take out the elasticity. Lacquer thinner is the best cleaner. I've also used 150-proof, 80%-pure vodka. When I worked at a TV station, we used it on lenses and film chains, because it dries so cleanly. It's an excellent cleaner for head stacks and things, because it's so pure, unlike oil-based isopropyl cleaners. On the moving parts, like the transport, a little sewing machine oil makes a big difference. Just little drops, here and there, of the 5- and 10-weight stuff. Stay away from sili-

cone-based lubricants like WD-40, because under heat, they immediately break down.

Every 400 to 500 hours, give a hard look at the head. Pull out the stack and bring it to a qualified service facility so they can check it with a microscope and see how much life it has left to it.

Oren/Mirromere: Every day you should align the tape path and adjust tape tension. If the machine gets out of cal, especially in the tape path, then you get more head wear in one area than another. That problem can't be solved readily with resurfacing. The engineer can visually check the machine—as long as it handles tape properly, you don't have to get out your 'scope and meter. If the machine's working 12 to 16 hours a day, then once a month you should touch up the head azimuth, tangency and zenith, and get out the 'scope to make sure all voltages are correct. If the machine sees very heavy use, you should replace the rubber every six months. Lubricate the machine in the proper places using the proper amounts, which is limited on most machines—use very little oil in a tape machine for the most part, because if you dump it in, pretty soon all the bearings will clog up. A lightweight mineral oil is best, not fossil oils.

Also, a good rubber cleaner makes pinch rollers last a lot longer and doesn't let tape oxide build up. If it does, eventually they become so hard they can't pull tape through the capstan shaft.

Jim Hartley: Some machines are so new that it will take time for them to establish problems. Older machines need more care, but problems can usually be solved at some level. Constantly maintain them, and make sure the machine performs consistently. We get stuff in such horrendous shape that it seems some studios don't do anything to maintain their machines. A lot of people slide because they don't want to invest the money on the machine [maintenance], and that comes back at them later.

What ATR parts need service the most, or the earliest?

Rosati: The heads wear, just through normal use, and they need some correction in their mechanical alignment as the wear progresses. Eventually they need to be sent to a company that specializes in restoring the heads, relapping them to their original contour.

Forman: Anything mechanical or in the tape's path will need replacement, like tape guides, the heads, pinch rollers, capstan. It's like the tires on your car, you're going to drive around and they're going to wear out. You can see the pinch roller starting to get shiny and smooth, from tape wear. That's easy to replace. You can see when the metal tape guides start to get grooved; they're normally completely round, and start to flatten out on the surface. On a lot of machines, you can rotate them—like tires. If you check your heads on a daily basis, and notice you're getting some high frequency loss or low frequency lobing, you usually can get by with relapping the heads, which is much less expensive than replacing.

Garrett: On older machines, relays and switches went out first. Now, they're all integrated circuits, you change whole assemblies. They've gotten pretty stable; some are even software-driven. It's hard to say what part will go first; I'd say probably the tape tension assembly, especially if it's not one of the newer machines, and especially on 2-inch machines.

Delaney: Generally, heads go out first, but if the machine's aligned properly, the heads last a long time. Once they get grooved, they're pretty much shot. Keep your eye on that kind of thing—the capstan wearing out, anywhere the tape travels or meets friction. That's why you keep things clean and lubricated.

How do you know when it's time to relap the heads?

Rosati: When you play the alignment tapes, you'll notice an instability in the VU needle motion. The meters show the tape-to-head contact is not intimate any more, as the heads wear from their optimum contour. Also, with the naked eye you can see if the wear pattern is establishing itself properly, going straight and true. There are spot checks for checking the azimuth (the side-to-side tilt of the head); two outside tracks can be summed together and we can watch for a 6dB increase of the voltages.

A head should last 2,400 hours before it needs to be relapped. Depending upon the head manufacturer, the tension and alignments, you might get three or four relappings out of a head. After that, there's just not enough metal left on it, and it needs to be replaced. I've got to stress the importance of establishing a good, even wear pattern, because you're never going to stop wear, and tape is abrasive to the head. So try to make that pattern as good-looking as possible—centered over the gaps, parallel from head to head and tangent to the tape. If you do that, the heads can have a normal life, where you get a lot of hours, relap, a lot of hours, relap, and eventually purchase a new head. If the wear pattern does not establish itself properly, because of mechanical misalignment or elevated tape tension, we may have to send in the heads, and lots of material has to be removed to reshape the head to the original contour. Thus, we lose an entire relapping.

Budd: You look at the head to see if there's any extraordinary wear patterns. Plus, you notice it in the audio electronics alignment, because it won't tweak up on the high fre-

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quencies like it should; or it will fluctuate because tape-to-head contact is becoming poor.

Oren: Test equipment and alignments will tell when your frequency response is starting to shift because of the heads; your electronics alignment lets you adjust for that, but at a certain point the electronics no longer compensate for the head wear, and you can see your low end fall off and high end rise, which is obvious indication that the heads need relapping or replacement. For the alignments, use a reputable, brand-name calibration tape, such as Magnetic Reference Lab, Standard Tape Lab or RCA.

When is it time for a complete overhaul?

Forman: Older machines were really built to run longer. Nowadays, technology is getting more disposable. We recommend that tape machines used heavily have a major checkup every 90 to 180 days.

Delaney: You have to go by [the number of] hours on a machine; if you maintain it, you can go for years without a full tune-up. If the machine's running on the average of 20 hours a week, then a tune-up should happen every six months, whether there are problems or not.

Oren: When tape tensions are off, sound quality is poor, there's roll-off in the low end and rising response in the high. When I think of "overhaul," I think of the motor—the thing simply won't turn. Or wow and flutter is so bad, you can't use the machine. This might require just a transport alignment, not a new motor, so a technician with the right test gear and know-how should be involved in the trouble-shooting. In most cases, what's wrong is relatively simple to make right. More often than not, an inexperienced person will get in there and probe around, and that's usually the cause for major failures and complete rebuilds. ■

—Linda Jacobson

association/background association. We want it to be functional, to aid people doing their job, and we also want it to not be offensive to people."

Case lists a few of the measures instituted to redress some of the "Muzak sins" of the past:

"One of the things you don't want to do is have a large, lush string section play the melody. Back in the old days that's what was done and people find that it's objectionable—it just sounds unbelievable, unnatural. It makes the song a joke, something that people laugh at when they hear it, and we don't want to do that.

"I had an arranger mention to me the other day: 'Well, I'm thinking about using a trombone to play the melody.' I said, 'That'll sound like the 1930s or something—wah, wah, wah. It's not the kind of sound that we want. We want a contemporary sound. We want something that doesn't sound like it was recorded 40 years ago, but that sounds like it was recorded today.

"The public's taste and perception of music have changed—they expect the best. They're more educated and they're just not going to put up with accordions, harmonicas and Hammond organs."

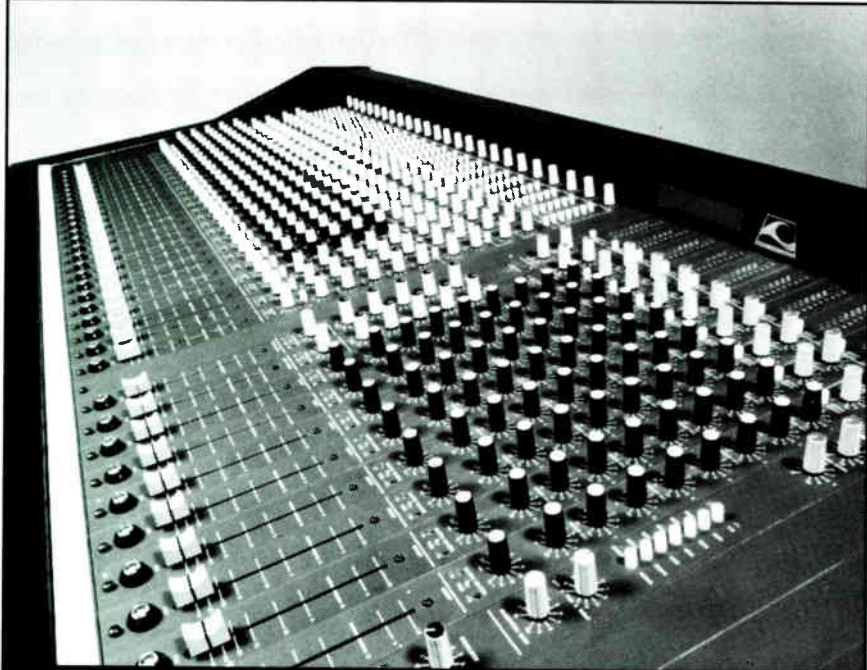
No wah-wah-wah, no oom-pa-pa—what instruments could possibly be left for Muzak melodies?

"We let different instruments take the melody," Case says. "For example, having a gut string guitar, or a steel string guitar play the melody and then have a sax come in and do some, and then a piano and then back to the guitar. It gives a little life to the song, a little less monotony. Often in the past, background music had been recorded with a very limited number of musicians. The trumpet would be the melody all throughout the song. It makes it boring, lackluster—well, it's partially responsible for the reason why people call it elevator music and things like that."

Technology and Muzak

I always used to ask myself if there were ever really a room full of musicians playing and recording that stuff I heard in my dentist's office. Finally I got my chance to get some answers—and to hear about Muzak recording techniques in the age of synthesizers, MIDI and sampling.

Case cites the use of multi-track studios (he reports that nearly all re-



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cordings are done in 24-track studios, 30 ips on 2-inch tape, with a very few done still in 16-track) as one of the biggest contributors to higher quality recordings, in addition to the aforementioned studio gadgets.

"At one time, recording Muzak was different because you were recording full orchestras and it was so expensive," he says. "They were not using multi-track techniques—they were recording 'one-up'—you had your entire orchestra there, you miked them and you did it live to 2-track, just going one after the other.

"The same kind of techniques, as far as people reading charts and doing it as quickly as possible to keep costs down, happens today, but because of multi-track it makes it more convenient and cost-effective. We get a more consistent sound because if someone screws up, you can go back and do it over again. With the older technique, it would be real hard to go back and do it over again."

Case reports that the studios Muzak hires use all the best toys (he declined to release their names for fear of opening them up to the competition), though he cautions his arrangers

"One of the things you don't want to do is have a large, lush string section play the melody."

against the "lone synthesizer" sound:

"There are a couple of selections that we have used which are all synthesized. That's very rare and that kind of sound is very delicate. It's tough to do and most people just cannot do it. We don't want to have too much of that in the Muzak library.

"When you're dealing with an instrumental, all of a sudden all of the sounds become much more important

than in a vocal piece. If you use the same synth sounds in instrumentals as are used in vocal pieces in popular music, it sounds kind of cheap, like a toy. One of the ways that we get around that is with MIDI and another way is through sampling.

"One of the things which is used quite often and which is touchy is the sampling of a string sound. It's touchy because some of them sound like strings and some of them sound like cheap synths. And the programming is very difficult to come by. I believe probably the best string synth sound that I've heard came from a 360 Systems synthesizer."

Muzak Recording Tips

Case is on hand for most of the recording sessions, functioning as a sort of "executive producer." I asked him to describe his handling of the various instruments in recording Muzak:

Brass: "Brass can add a little sparkle, a little energy, a little life to a song, but at the same time too much makes it sound like Big Band kind of stuff. You need something kind of like brass pops—in and out real quick, something full but contemporary. Perhaps



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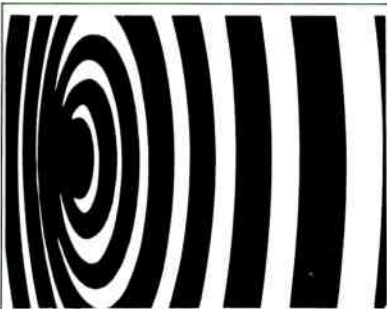
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two trumpets, a tenor sax and an alto sax—record them all together and you come up with your light brass section. It's not too much, but just enough to add a little flavor, a little energy and life to the song."

Percussion: "Another thing that can be done—and that's lacking from a lot of this kind of music—is percussion tracks. If you go with either 8- or even 16-track productions, there's just no room for little percussive things which actually add a lot of life and energy to the song. It takes a lot of the boredom out without being offensive and without interfering with the stimulus progression. By percussion I mean some light fingerpops, snapping the fingers and all the different percussion instruments. They add a little embellishment that's not there otherwise. There's room to do that with 24-track."

Drums: "To make our sound more contemporary, we are using a drum machine, along with a synthesizer. The programming of the drum machine is sensitive; you need to have someone who knows what they're doing. There's a real talent necessary; again because we don't have vocals, all these instruments become more important. Sounds that could be used in a normal pop arrangement really stick out in an instrumental arrangement and so become more critical. Jarring sounds in music creates a tenseness in people. Yet it doesn't have to be soft, it doesn't have to be slow. It can have that energy and tempo."

Guitar: "The guitar is a real touchy instrument because in most of the commercial music, the guitar has an edge to it. A guitar with an edge to it stands out for the end user, and that edge causes a jarring effect on the psyche of the user. There are several ways to take the edge off the guitar. You can use a different type, like an acoustic hollow body, either with steel or gut strings. You can also use an electric guitar that is hollow bodied, that doesn't have quite the edge of a Fender Stratocaster. You can use equalization to take the edge off the mid-range and the high, or remove some of the bottom if that's sensitive, but I've never run into a situation like that. You can run it through a flanger; if you adjust it properly, you can soften it up just enough to keep it contemporary, keep it like *real* music, but at the same time make it adaptable or suitable as background music."

Marketing Muzak

How does Muzak get from the studio into your local shopping mall?

Tom Evans, the company's marketing director, explains: "The tapes are transcribed to ¼-inch, 12-inch reels and shipped to our satellite uplink. They are downlinked from there to 175 music franchises across the U.S., ten of which are owned by Muzak."

"This is a C-band satellite transmission that transmits both those signals—Muzak environmental and FM-One, which are picked up by our franchisees on 4-meter dishes at their franchise offices. Then they lease a frequency from a local radio station to cover their territory and they put a tuner and antenna in at the business customers."

Muzak works through independent franchisees, with a system similar to McDonalds or other national chains. Franchisees pay a flat percentage of their subscriber sales. The one difference is that the market is closed—the entire U.S. is already covered with Muzak franchises.

"In the late '30s, early '40s and right after World War II, Muzak went out and fully franchised the United States with a bunch of entrepreneurs," Evans said. "As a result we cover the U.S. with franchises that are territorially oriented—they may cover a city or several counties or in some cases even a state. The franchisees pay a flat percentage fee of their subscriber sales."

The overall impression I got from speaking at length with different Muzak employees is of a small, dynamic business which covers a large market. Each person seems to wear several hats; many have come to the company recently from competitors. (Muzak itself recently was acquired by the Marshall Field Corporation from Westinghouse.) There's a sense of change and energy in the company; it's not greying men in cobwebbed rooms making music like it was done when they were young.

It's true that from a musical standpoint, there are many things Muzak is *not*. But if market saturation, longevity and scientific research are any indication, Muzak seems to be everything it sets out to be—and perhaps a little bit more. ■

Josh Gressel, a Mix editorial assistant, last year returned to the U.S. to do graduate study in psychology after eight years on a kibbutz in Israel.

by Robin Tolleson

THE DUB MASTERS

SLY DUNBAR AND ROBBIE SHAKESPEARE

For Sly Dunbar and Robbie Shakespeare, making *Rhythm Killers* was almost a matter of going back into the garage. "We said, 'Let's try recording some of the stuff we used to play in the early days in Jamaica.' We listened to rock and R&B a lot, and of course we listened to reggae, which we love. That's our background," says drummer Dunbar.

Rhythm Killers has got to be the party record of the year. It's an unyielding barrage of naked, undisciplined musical energy, produced by Bill Laswell, with use of his Fairlight and regular stable of musicians. Island Records

owner Chris Blackwell had a lot of input into the music as well. "Chris had the concept in mind. He wanted us to make it a non-stop album, so we did just that. We made every song go into another," says the drummer. Blackwell suggested that Sly and Robbie cover the Ohio Players' "Skin Tight." "But when we listened to both 'Skin Tight' and 'Fire' from the Ohio Players, we thought that 'Fire' had a better groove, for now, and so we chose it instead. I remember playing it on stage when I was in a club band in Jamaica. And 'Yes We Can Can' was a song that I loved so much, a very good

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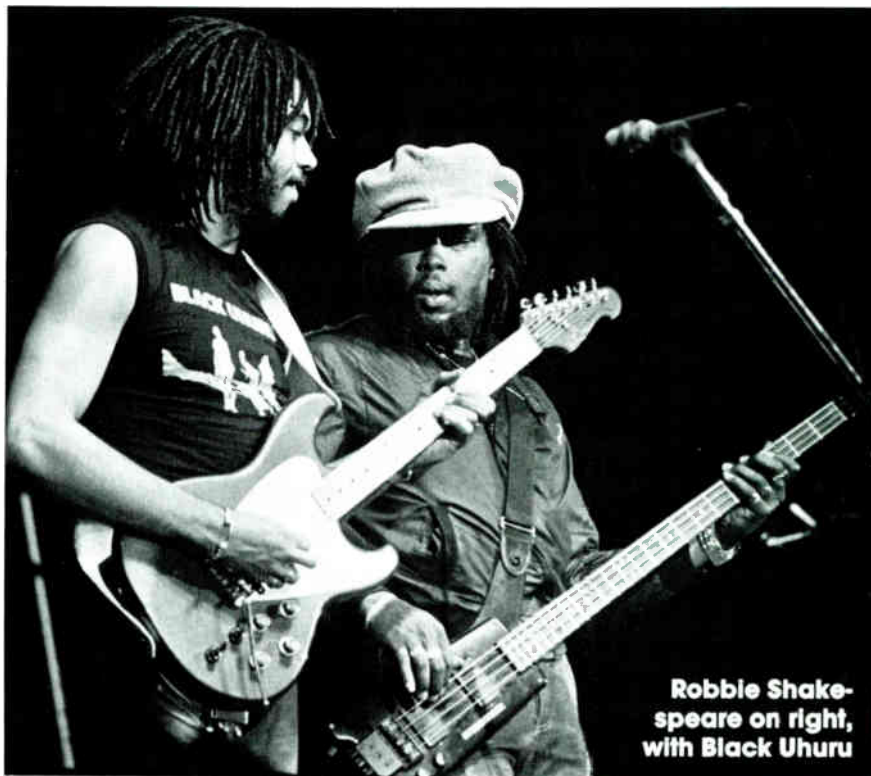
PLAYBACK

track. I think it's one of the Pointer Sisters' best tracks up to now."

While clubbing in Jamaica, Sly and Robbie jammed on rhythm and blues classics by the Ohio Players, Aretha Franklin, James Brown, Harold Melvin and the Blue Notes, Parliament-Funkadelic, as well as calypso, and of course, reggae. "We had a mixture of music because we were playing for people to dance," Dunbar says. "We had to play

make it sound good."

Sly and Robbie have been working together for almost 15 years. They used to walk back and forth across the street to listen to each other's groups in Kingston, Jamaica. Their publicity material says they've played on over 10,000 records, a figure that is hard to believe but difficult to refute. Maybe that's including all the sessions in Jamaica that were done with their stolen rhythm tracks. Sly and Robbie credit a 1978 tour they did with Peter Tosh, opening



Robbie Shakespeare on right, with Black Uhuru

from the Top 40." From the beginning of their musical relationship, the groove has been central. "I don't think people can dance to a song if it doesn't have a groove. The groove is very important."

Sly and Robbie never had much trouble finding the groove, according to the drummer. "Yeah, we hit it exactly on the nail." To Sly, the trick is in the ears. "We listen to each other a lot and support each other while playing. If Robbie is playing a wicked groove for a bass line, what I try to do is fit the drum part in that so it doesn't take away from what he's playing but adds to it. And if I come up with a good drum part, then he puts a bass line that doesn't take anything away from the drum part, but adds to it so that both things become one. We don't try to outdo each other. We're just there to

for the Rolling Stones, as their breakthrough to the U.S. recording studios. They haven't had much of a break since then. Bob Dylan (*Infidels*), Mick Jagger (*She's The Boss*), Herbie Hancock, Cyndi Lauper, Yoko Ono, Grace Jones, Nona Hyndryx, Kazumi Watanabe, Joe Cocker, Jimmy Cliff, Burning Spear and Big Youth are just a handful of the artists the duo has worked with. They also have been the guiding rhythmic light for the popular reggae band Black Uhuru, with whom they won a Grammy for Best Reggae Recording in 1985. Their credits have appeared all across the musical spectrum, sometimes under the name the Riddim Twins, sometimes as Drumbar and Basspeare.

"Ion Storm" from Black Uhuru's 1985 release *The Dub Factor* is a good example of how sparsely the duo can play, while building their strong

PHOTO: RON DELANEY

groove. Sometimes Sly will drop out completely for a time, then dramatically re-enter, and Robbie does the same thing. "What they do in a dub mix sometimes, they take the whole drum section out at times, and then bring it back in," explains Sly. "They might take the bass out at times, bring it back in and keep interchanging. Sometimes leave the rhythm by itself, and things like that." Sly and Robbie might not always be responsible for what happens to their drum and bass mixes on record. But that particular trick is one they use when they leave the studio. "When we're playing live onstage we do it like that," the drummer says. "I come out sometimes and Robbie comes out sometimes, and we just come back in like that."

Now Dunbar and Shakespeare are getting into producing—they worked on Gwen Guthrie's *Padlock* album recently—and once again, they're working as a team. "Sometimes when you're producing alone, I think you might get a little bit—not mixed up—but it's your idea alone that's working. Sometimes it's good to have two persons," the drummer says. "You might hear something one way, and he might say try this or try that, suggest things, and you can sit and think of what sound you'd like. And if we both agree then that's it."

In 1985 the duo did an album called *Language Barriers*, which was produced by Laswell, and made use of an all-star group featuring Manu Dibango, Herbie Hancock, Bernie Worrell, Doug E. Fresh and Eddie Martinez. The record fuses all kinds of grooves, leaving reggae in the backdrop in favor of their rock and soul explorations. It was like an organic version of Laswell's Material group. "Sometimes Robbie and I like to create things, try new things," says Sly. "We're not looking to say, 'Well, this is *the* sound. We're going to live on this sound.' We like to do things and create new things all the time."

Their new *Rhythm Killers* album required quite an editing job—a lot of splicing was done to make all the music flow together like an uninterrupted performance. "Like when Shinehead came into the studio to do three or four vocal tracks, they would take out the best parts and slide them into different places, and they'd cut tape and put a spot here and there. There was a lot of cutting for 'Boops.'"

"Boops," which follows "Fire" on

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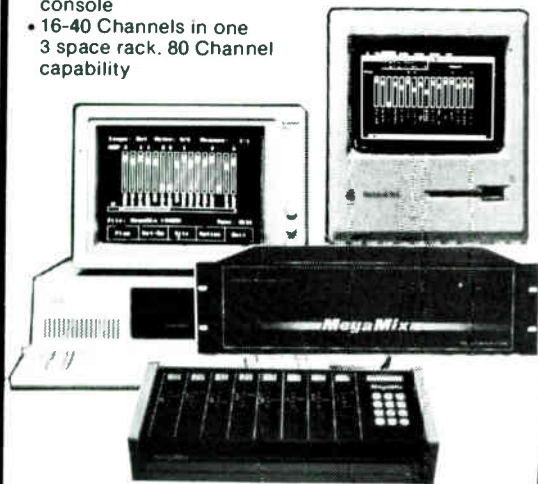
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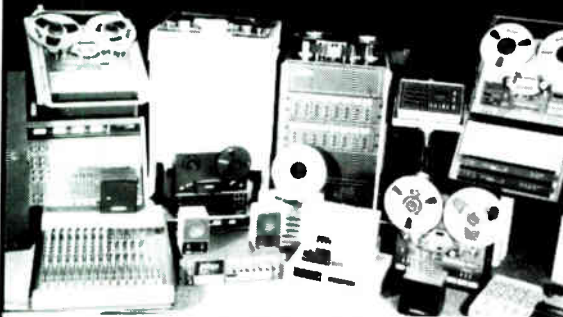
side one of *Rhythm Killers*, is an inspired funk jam with bits of Bootsie Collins, Howard Cosell (actually a Shinehead impersonation), all driven by Sly and Robbie alone with some strings floating in and out. "In today's music, everybody's leaning on the bass and drums. People want to dance, and

Rhythm Killers has got to be the party record of the year. It's an unyielding barrage of naked, undisciplined musical energy.

I think that's the whole groove of the music, the bass and drums," says Sly. "And we didn't want to crowd it that much. We wanted to leave it a bit empty so that you can feel all the vibrations of the bass and drums."

A lot of the drum sounds on *Rhythm Killers* were triggered by Roland DDR-30 pads, from co-producer Bill Laswell's Fairlight synthesizer. Even though Sly owns several drum machines, he says all the drumming on the record was done in real, human time. "The trick is being comfortable while you're playing, and hearing your drums properly. Not playing too soft or too hard," he says. "The bass player has to be super steady, which Robbie is. Once we start a track, I can look at Robbie and I know he's steady. So sometimes I see from Robbie if I'm

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going too fast. I watch his fingers moving and I can bring it back down just a bit. Sometimes we move a tempo in and out, and people don't realize that we're both doing it at the same time, without looking at each other. People don't realize that it has moved."

Dunbar samples percussion sounds onto an E-mu SP-12, also using the Akai S900 and Emulator sometimes. He likes recording with the Simmons SDS9 electronic kit (he prefers the original, harder Simmons pads), and other times he uses the Roland Octapad. "It all depends on what the song really calls for," he notes. "I take along only what I really need."

When they're working in the studio, they like to build tracks from the bass and drums up: "When we're working on our own stuff we do it like that, because sometimes we might not have a song in mind, and Robbie and myself will go into the studio and start grooving. And then it starts working from there. Once we get a good bass line going with the good drum pattern, then we have something to work from."

They don't always rehearse before going into the studio; in fact, they prefer not to. "Sometimes I'll make up an idea and say, 'Robbie, this may be a drum part idea.' And we just go inside and cut. Sometimes you can be hearing the song so often that you become tired of it and can't enjoy it any more. So we like to go in and record it while we're enjoying the song, before we get tired of it. Even this album, I don't play it any more. I've enjoyed working on it and I think now it's time for the people to enjoy it. I'm moving on to other things immediately, because that's done."

The drummer claims to have many influences on his instrument. "In Jamaica there's a drummer named Lloyd Knibbs. I think he's one of the best drummers in the world. Also the late Al Jackson, from Booker T & the MGs; Perry Young, who used to play with Philly International; Jeff Porcaro; Steve Gadd; Billy Cobham; Steve Jordan; Omar Hakim. There's a lot of people."

Robbie Shakespeare's first big influence was Aston "Family Man" Barrett, bassist with Bob Marley and the Wailers. "I used to listen to a lot of different music," the bassist says. "Ska, rock and roll, and country & western, which was actually my favorite music. I listened to Marty Robbins, Frankie Laine, John-

ny Horton and Booker T & the MGs." According to Shakespeare, there was only one radio station in Jamaica, and it played all kinds of music. "All these were my favorites growing up."

All these influences came together on *Rhythm Killers*, which was recorded at Quad Studios in New York. "I think it's a good production," Sly says. "And I like it a lot. This is our second album in the R&B department, and I think it's a good try. We're not going to stop playing reggae, but this music we're playing now is what we learned to play when we were playing in club bands in Jamaica, so we're bringing the past up to the present. It's a good album,

and I think it's going to be a collector's item.

"I feel good even if it doesn't become a hit," he laughs. "We will always keep producing, and playing for people if they want us to. That's what we're here for, I think, so we can't stop." ■

Robin Tolleson freelances for Mix, downbeat, Musician and is associate editor for Drums & Drumming. His first book—The Unofficial One-On-One Handbook (Written By A Couple of White Guys Who Can't Dunk)—is coming out this fall on Turnbull & Willoughby Books.

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by William Johnston

ORBAN 464A CO-OPERATOR

First of all, anyone looking for flashing neon lights and high-tech gloss can skip the following: there are no MIDI-to-Morse code translators, no pre-programmed dog bark samples and not even an RS-232 port. This is not to say that Orban is behind the technology of today. Quite to the contrary, the Orban Co-Operator is a highly sophisticated device offering versatility and an incredible range of applications. (Which is more than you can say for a sample of a dog.)

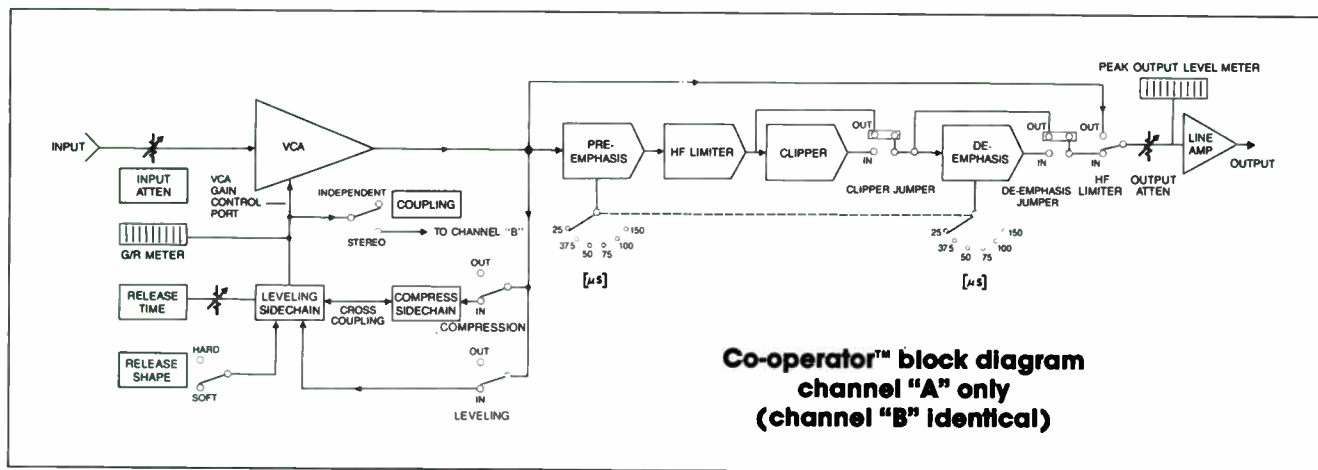
The Orban 464A Co-Operator is an integrated leveler/compressor/high-frequency limiter that is ideal for any situation where transparent gain reduction is needed. The Co-Operator basically is split into two main systems (Fig. 1). The first of these systems, the Automatic Gain Control (AGC), is itself divided into two sub-systems, a leveler and a compressor. The leveler provides smooth gain riding by automatically adapting the attack and re-

lease times to the nature of the program material. The leveler has an average attack time of around 200 milliseconds, and thus instantaneous peaks will not be affected. This long attack time results in very natural-sounding gain reduction.

The user can fine-tune this process by adjusting the release time from approximately 1 to 5 dB/sec. The user also can adapt the release shape of the leveler. Below 10 dB of gain reduction, either a constant dB/sec. release rate (Hard Release) or an exponential rate (Soft Release) may be selected.

The compression function provides further control of transient overshoot and more extreme gain reduction if the leveler is insufficient. The compressor features an attack time of around 5 milliseconds, and a static ratio of greater than 20:1. The compressor function can be used independently of the leveler for use as a safety limiter, or the leveler can be used

The Co-Operator's logical design is evidenced by the unit's signal flow chart and straightforward front panel layout.



alone if the compressor is deemed unnecessary. The Co-Operator is capable of a maximum of 25 dB of gain reduction which is achieved with a low distortion, Class-A proprietary VCA.

The second main system of the Co-Operator is an independent high-frequency limiter. This defeatable limiter can be used to prevent pre-emphasized material from overloading the downstream equipment. The limiter is essentially dynamically varying a 6 dB/octave shelving low pass filter with a 30-millisecond release time. The limiter includes six selectable pre-emphasis curves ranging from 25 to 150 microseconds. The high-frequency limiter also can be internally strapped for flat response. Also included is an internally defeatable peak clipper which follows the HF Limiter. This clipper allows a "peak overload" point to be set. Since the peak clipper has instantaneous attack and release times, it affects only the offending peak and not other program material. Thus, it is more suited for final, absolute protection than are the earlier gain reduction-oriented stages which control *average* levels into the clipper.

The individual high-frequency limiters always operate independently. Even when the Co-Operator is in the stereo mode, the HF limiters are not coupled. Nevertheless, the stereo imaging remains stable because a very short (30-millisecond) release time is used. As with the other functions of the Co-Operator, the HF limiter can be used alone in either channel by defeating the other functions.

The Co-Operator, as mentioned, does provide for dual or stereo operation which is selectable on the front panel. Each channel has a hard-wired operate/bypass switch as well. The metering section includes two LED bar graph displays for each channel, one for gain reduction and the other for peak output level. Also included for each channel is an LED which lights during HF limiting. The gate threshold has an LED to visualize the gating response.

A hidden panel keeps the less user-oriented controls out of harm's way. The HF limiter pre-emphasis controls are here, as well as the peak meter calibration and the peak output level adjust. The rear panel consists of a

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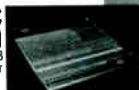
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FIELD TEST

barrier strip with #5 screws, wired in parallel with balanced ¼-inch phone jacks. The rear panel chassis is punched to accept XLR connectors as an option.

My first impression of the Co-Operator was that it seemed best suited to audio applications outside of the recording studio, yet I soon found that even this restriction was a bit hasty.

My first application of the unit was simple stereo limiting for cassette duplication. Using a highly dynamic and sibilant analog source, I transferred to cassette using the leveler, no compression, and the HF limiter set at 75 microsecond pre-emphasis. Even when relatively high gain reduction with HF limiting occurred, the Co-Operator was surprisingly transparent. Adjustment of the gate threshold was critical due to the analog source, and I found the control easy to set, whereas in some gain reduction devices it seems that a slight touch of the threshold knob causes a drastic change, making fast setups more difficult.

I also tested the unit as a system limiter in a live sound reinforcement situation to protect the amplifiers and

ORBAN CO-OPERATOR

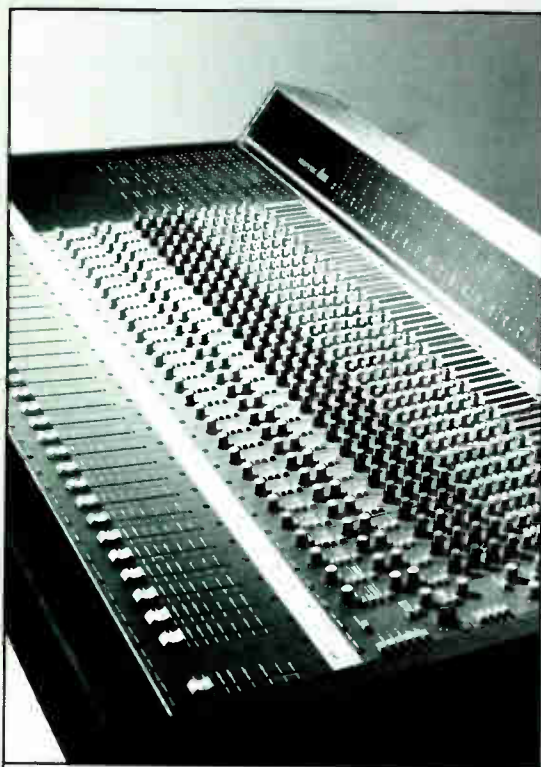
SPECIFICATIONS
Input Impedance: >10k ohms, active balanced, EMI suppressed
Operating Level: -10 dBm to +8 dBm
Output Impedance: 93 ohms, balanced and floating
Minimum Load Impedance: 600 ohms
Output Clip Level: > +20 dBm into 600 ohms
Frequency Response: 20-20k Hz ± 0.25 dB below all thresholds
RMS Noise: 20-20k Hz greater than 85 dB
Interchannel Crosstalk: less than -60 dB at 15 kHz (-67 dB typ.) falling at 6 dB/oct. below 15 kHz.

LEVELER/COMPRESSOR
Interchannel Tracking: ± 0.5 dB in stereo
Total Harmonic Distortion: <0.05% at 1k Hz (with release time control centered and 15 dB gain reduction) typically <0.1% @ 20Hz, 0.03% @ 100Hz, 0.05% @ 2k Hz, and 0.1% @ 10-20k Hz.
SMPTE IM Distortion: 0.05% (60/7000 @ 4:1 with 15 dB of gain reduction.)
Gain Reduction Element: Class-A proprietary VCA

HIGH FREQUENCY LIMITER
Total Harmonic Distortion: $\leq 0.02\%$ THD added to sine waves passed through leveler/compressor
Gain Reduction Element: junction FET
HF Limiting Curve: 6 dB/octave
Power Requirements: 115/220 volts AC $\pm 10\%$, 50-60 Hz, 16 VA
Dimensions: 19.0" (48.3 cm) wide, 9.625" (24.5 cm) deep, 1.75" (4.5 cm) high

high-frequency drivers. In this system, the amplifiers were just powerful enough to drive the desired SPL level and thus had to be kept close to the clipping level. I placed the Co-Operator after the crossover to protect each amp separately for maximum efficiency. Using the compressor (no leveler), the HF limiter set to 37.5 microseconds, and the peak clipper engaged, I

was able to drive both amps hotter than normal since the Co-Operator silently defeated previously troublesome peaks. I was sure that the unit would be more audible than it is, as I am usually skeptical about limiters, yet the Co-Operator is subtle until you get into extreme compression. The stereo imaging was very stable, and the peak clipper worked perfectly.



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Finally, I got the Co-Operator in the studio. I assumed that I would use it only for controlling levels of the overall mix, yet I found it very useful for laying tracks as well. Many studio engineers who have grown up on compressors with variable attack times and ratios may at first think the Co-Operator inflexible. Yet, I found the leveler and the compressor offer a very quiet and easy-to-use combination. The noise floor of the unit was never a problem for me, and I was even able to achieve a good de-esser function out of the HF limiter. There are more specialized de-essers on the market, yet the Co-Operator performed well even in this task. Overall, the Orban Co-Operator has a clean, punchy sound ideal for voice or music tracks as well as mixed program material.

The only addition I would want on the Co-Operator is a screw-set calibrated position for the input attenuator, gate threshold and release time. In studio applications, as I switched from laying tracks to dumping to cassette, I wished I did not have to go through the setup routine each time. This also would protect the Co-Operator from tampering when used in a protection system. Orban does supply a protective cover for the entire unit as an option, however. Furthermore, it would be more convenient to have a peak clipper defeat switch concealed behind the hidden panel in front, rather than an internal jumper.

Orban is to be commended for their documentation in the manual. Although I received a preliminary copy, it was incredibly complete. It covers all aspects of the functions, applications, setup, grounding, instructions, calibrations, etc., in a simple, non-confusing manner. My manual came with clear schematics including board layout and explicit grounding diagrams which were greatly appreciated.

It is impossible within the scope of this review to cover all the possible applications of the Co-Operator. Aside from the previous uses detailed, at \$959 the Co-Operator is ideal for audio/video production where low-quality analog tracks are a problem, unattended PA systems, broadcast studio/transmitter link protection, FM subcarriers, and disc cutting facilities. There may not be a lot of high-tech gloss on the surface, but the Co-Operator is a true workhorse in nearly all aspects of audio production. ■

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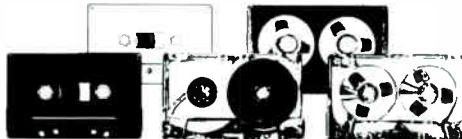
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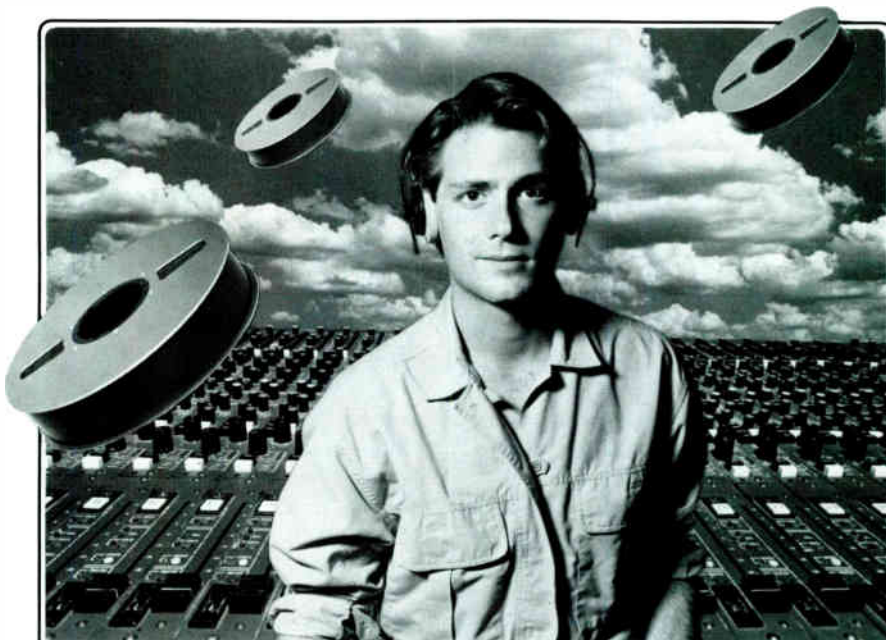


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by Chris Formato

KEF

REFERENCE SERIES MODEL 107 LOUDSPEAKER

It used to be that all studio monitoring was done through a pair of large speakers set upon a shelf or perhaps built into an overhead soffit. As time went on, it was decided that alternate speakers should be available to give the engineer the option of more than one sound perspective; perhaps using "home" speakers to more closely approximate the listening environment of the consumer. Still, it was distant listening, affected (plagued, as some would put it) by the acoustic qualities of the surrounding walls, ceiling, and floor.

In more recent years, near-field monitoring has become an alternative to distant listening. This type of monitoring situation has meant small speakers sitting on the console meter bridge, which is okay if you don't mind the lack of bass response or power handling capability. Small boxes just can't put out true low end. On the other hand, the studio manager probably won't be too thrilled when the meter bridge crumbles under the weight of the big boys, whose up-close stereo image may be poor because the ear hears each driver in a different place. What to do?

Enter KEF's new flagship model, the Reference Series 107. Although designed as a top quality audiophile loudspeaker for the home, the 107s provide a unique answer to the question of deep bass at high levels in a near-field studio monitor application.

The 107 is a tall floor-standing system, with dimensions of 45.9" x 13" x 17.6". At this height it needs to be raised about a foot to get the drivers above the height of most meter bridges. Sitting on top of the main enclosure is an 8.5 liter "head" which

houses the MF/HF drivers: KEF's 4-inch B110 midrange and 1-inch T33 tweeter. This "head" can be swiveled in the horizontal plane to allow the listener to aim it for optimum imaging. The shape of the head is such that the



PHOTO: LAURA TYSON

corners are rounded to reduce diffraction effects. In the 107, the head is injected with a high density, mineral-loaded polymer for better damping. Both the heads and the main enclosures are marked "R" or "L" and KEF states in the assembly instructions that these orientations must be maintained for the system to function properly. A gold-plated XLR connects the head to the main enclosure.

As with the other Reference Series models, the 107 is expertly finished in real wood veneers; your choice of walnut, rosewood or black ash. Black cloth grilles stretched over wooden frames are provided to cover the head assembly if the user desires.

The 107 is no lightweight, owing a considerable amount of its 99 pounds to heavy internal bracing. Power amp connections to the main cabinet are made via gold-plated terminals which will accept bare wire or single bananas, but unfortunately they are spaced too wide for the preferred dual-banana configuration.

One of the unique features used in the 107 is called Conjugate Load Matching. The impedance of a speaker sys-

tem changes with frequency, often dipping down to an ohm or even less. This can put considerable strain on the power amplifier in terms of peak current demand, forcing the amp to give transient distortions and even excite current limiters or other protection. KEF's idea was to present the amplifier with a constant pure resistance of 4 ohms, an ideal average value. To accomplish this goal, circuitry which is the equivalent inverse of the drive unit and crossover circuits has been added, housed in the MF/HF head. With all reactance components effectively cancelled out, the 107 appears to the amplifier as a 4-ohm resistor, thus sensitivity and maximum output are effectively doubled when compared to that of an 8-ohm speaker. Sensitivity is rated by the manufacturer at 90 dB SPL at 1 meter on reference axis for pink noise input of 2.83 volts RMS. Recommended amplifier power is 50 to 300 watts into 4 ohms. This means that 300-watt peaks on the stereo pair can yield 123 dB SPL at the mixing position.

Another design technique is called Coupled Cavity Bass Loading. In this

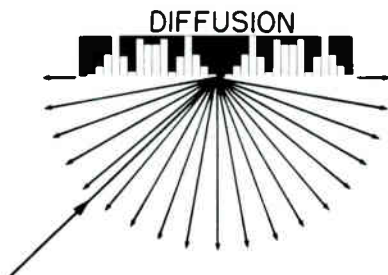
system, two 10-inch woofers are mounted vertically and down firing in separate sealed enclosures, and share a common "bandpass" enclosure located in the center of the main cabinet. This common enclosure gets its bandpass characteristic from the fact that its output is taken through a port, thus no output is lost through cancellation below the tuning frequency as is the case with conventional reflex designs. The port is actually vented to the top of the enclosure where it is more coincident with the output of the head unit and high enough to avoid reflections from the floor. This makes near-field imaging quite ideal since the arrangement closely approximates a point source. Also, it means that only the head of the system needs to be positioned above the meter bridge; the bass enclosure can do its thing out of sight.

There are two advantages to using two drivers. The first is that the output level is doubled, and second, this "push-pull" arrangement allows the main distortion components from each driver to cancel each other out. A non-ferrous alloy bar links the magnet structures of the two drivers, and since

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FIELD TEST

their vibrations are out of phase, they too are cancelled out before they can reach the main cabinet to color the sound.

While the dividing and load matching circuitry are located in the HF/MF enclosure, the equalization circuits for the two speaker systems are located in a box called the K-UBE (KEF Universal Bass Equalizer), which, being a line level device, is inserted between pre and power amp stages or in a tape monitor loop.

K-UBE is an active device providing fixed EQ to the HF/MF drivers and variable EQ to the bass units. There are three large rotary controls on the face of the unit, labeled "Extension," "Q-Factor" and "Contour." "Extension" selects one of four cut-off frequencies: 50, 35, 25 or 18 Hz. For some reason KEF chose to label these "1" to "4," respectively. "Q-Factor" determines the response shape of the rolloff from ".3"-over damped, to ".5"-critically damped, to ".7"-maximum extension. Lastly, "Contour" controls the balance between low and mid frequencies by raising or lowering the response below 160 Hz by 3 dB. Thus it would seem that KEF has allowed the user to trade off between response all the way down to 20 Hz and the louder levels attainable at a higher rolloff frequency, depending on program material and individual taste.

In addition to its EQ function, K-UBE matches the sensitivity of the pair to a claimed .5 dB. It is evident (and stated in the owner's manual) that K-UBE must be used in circuit to attain proper response, although no harm will be done if K-UBE is not used. Each K-UBE is unique to the pair that it is supplied with and cannot be interchanged with K-UBEs from other 107 systems. Since K-UBE is active, the losses inherent to a passive system of equalization are kept to a minimum. Combining the K-UBE with the passive electronics located in the head, KEF has created what it calls a "hybrid network."

So with all of this fancy technology, how does it sound? Well, let's say that this is just about all you could ask for in a near-field monitor. The 107 allows close-up placement without giving up the deep bass that the smaller monitors lack. Imaging is rock solid, thanks to the swiveling head arrangement,

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RECORDING SPECIFICATIONS

- Tape format** • 1/2 inch AKAI original cassette tape (MK20)
- Track format** • 14 tracks 12 channels (including 1 control track and 1 sync track)
- Head configuration** • Super GX recording playback head (1)
Control head (1), Erase head (1)
- Tape speed** • 19 cm/s and 9.5 cm/s
- Pitch control** • ± 12% (of standard speed)
- Recording time** • 10 minutes (19cm/s) or 20 minutes (9.5 cm/s)
- Wow and flutter** • 19 cm/s: 0.03% (WRMS) ± 0.05% Peak (DIN IEC Weighted)
9.5 cm/s: 0.04% (WRMS) ± 0.06% Peak (DIN IEC Weighted)
- Distortion** • 19 cm/s: 0.5%, 0 dB (315 Hz third harmonic distortion)
9.5 cm/s: 0.8%, 0 dB (315 Hz third harmonic distortion)
- Noise reduction** • dbx Type I
- Cross talk** • (Between neighboring channels) 55 dB, 1 kHz (19 cm/s, 9.5 cm/s)

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World Radio History

and the fact that the drivers have been matched to very close tolerances. Since the speaker is away from the wall, depth perception is well maintained. With K-UBE in circuit, the differences obtained by varying the front panel settings are subtle; best described as adding a little more "oomph" to the low end, which, by the way, is very well controlled. By far its most outstanding characteristic is its transparency over the entire frequency range, not just the high end as is the case with many other speakers. That it can stay so clean in bass as well as the mids and highs—even at high volume levels—probably is due to the power handling afforded it by the Coupled Cavity Bass Loading technique.

Since the 107 was designed as a consumer unit, it has certain limitations for professional use. First and foremost, K-UBE is not designed to handle the +4 dBm levels found in the studio. Our sample was tested and found to clip at 2 volts, far below the admittedly rather high 36-volt output of our MCI console. This, of course, allowed only moderate listening levels before distortion set in when the K-UBE was patched into a tape machine path. It must be noted, however, that many consoles drop their monitor output at the patchbay to allow the use of power amps that aren't +4. Patched in at this point (between ALT MONITOR OUT and ALT AMP IN), the K-UBE behaved normally. Potential buyers should check their specific console before making the purchase. Secondly, but not as detrimental, is the fact that connections to the K-UBE are made via RCAs rather than XLRs. Perhaps KEF could make a balanced pro version (rack mountable?) or offer plans for the appropriate modification to overcome these limitations to an otherwise superb product.

Price for the 107s is \$3,900 per matched pair including K-UBE. Although this may sound a bit expensive for near-field monitors, one must remember this is a speaker that gives full-size performance in a near-field application; not to mention its other unique qualities. When you consider that full-size monitors can cost considerably more and not match such high output levels, or low distortion specs, it becomes evident that the cost of the KEF Model 107 is well justified. ■

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Telex Autoloader models are available for Panasonic models 6200, 6800 and 6810 or JVC model BR 7000UR video cassette recorders. For complete information, please contact Gary Bosiacki, Pro-Audio Division, Telex Communications Inc., 9600 Aldrich Avenue South, Minneapolis, Minnesota 55420. Phone 612-884-4051.

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by Phil De Langle

TAPELESS MASTER BINS WITH A BYTE

A

another link in the audio production/manufacturing chain is soon to be digitized as Concept Designs nears introduction of a tapeless master to replace the bin loop master in high speed cassette duplication. While Concept Design, the research and development arm of independent cassette duplicator American Multimedia, Inc. (AMI) is not the only company working along these lines, it appears to be the closest to offering a system for sale. If all goes well, a working version of Digital Audio Analog Duplication, or DAAD, will be cranking out demonstration cassettes at 80 times real time for attendees of the New York AES show this October. Reached at AMI's home base in Burlington, NC, company president Richard Clark and chief engineer Bob Farrow jointly responded to the following queries about the capabilities and design of their system:

Mix: What are the basic advantages offered by a tapeless high speed digital cassette duplication master?

AMI: The best way to answer that is to look at the process that is used now that our system will replace. Typically, what happens in any mass duplication plant when a customer sends in a master, whether it be analog or digital, is that the tape, in the analog domain, is sent through a Dolby 330 B-type encoding system, and then on to a half-inch or one-inch mastering deck at 3¾ or 7½ ips, depending on the duplication ratio of the final manufacturing system. That produces an analog running tape, which is put into the high speed duplication bin, spliced to-

gether end to end, and run as an endless loop master tape. Most people in the duplication industry feel that about 80% of our problems come from things related to the preparation and running of that tape.

Our system will enable us to feed a customer's analog or digital master tape directly into our digital tapeless

“As the master tape runs through the bin thousands of times, there is a continuous degradation until we reach a point that the product is no longer acceptable. With the digital system, it will be like having a fresh master for every tape.”

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4030

4030 Synchronizer with switching power supply



4035

and **4035** Controller for all major brands and models of tape recorders—both audio and video. Control up to one master and three slaves, or slave as many transports as you wish, just by adding a 4030 for each slave. A serial interface port allows communication with personal computers to run F.A.M.E., Fostex Automated Media Editing. SMPTE time code based, it works with 24, 25, 30 fps and drop frame, and features resolution to 1/100 of a frame, selectable pre-roll up to 99 seconds, 10 position auto-locate and **programmable, automatic punch in/out with rehearse function.**



4050

4050 Auto Locator is a full function remote control unit for Fostex Models 80, 20 and all E-Series recorders. In addition to tempo control, you can locate to the measure bar and beat, thus the 4050 is the first autolocator to think musically. Up to ten cue points can be programmed and you can punch in and out automatically. The 4050 is also a MIDI Synchronizer, featuring a SMPTE/EBU Time Code generator/reader—all four formats. Any MIDI instrument can be synchronized to this most accurate timing reference. You can also simulate the running of the recorder in order to have the SMPTE/EBU code run MIDI instruments only. There's even a serial communication port which lets you use a personal computer.

Merging Technologies

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master bin. Then it will be read out at very high speed into an analog signal. Duplicator slaves will be connected directly to it, and we will be able to eliminate the master tape from the process, hopefully getting rid of the lion's share of the problems that are incurred in high speed duplication. Distortion, noise, wow and flutter and all of the irregularities that are present in the final product can usually be traced to the mastering process, whether it be in the mastering bin, the mastering machine or in the master tape itself.

As far as the quality of the finished product is concerned, it will also be improved because all of the copies will be very consistent. Currently, the best cassettes we make are the first ones. As the master tape runs through the bin thousands of times, there is a continuous degradation until we reach a point that the product is no longer acceptable. Then we make a new master tape and start over again. With the digital system, it will be like having a fresh master for every tape.

Mix: What formats of cassette masters

will duplicators using the DAAD system be able to accept from their clients?

AMI: The digital bin speaks the same exact language as the Sony 1630, 16-bit PCM. We chose to use a digital language that is pretty much an industry standard. However, any format could be accepted, but it eventually would get converted into 1630 for loading into the bin. It's much like a CD master: it doesn't matter what you start out with, before it goes to CD it's going to be 1630.

Mix: When you begin using DAAD at your duplication facility, will digital tapes in non-1630 formats, such as F1, go through the analog domain to get to the 1630 format?

AMI: Unless it is converted externally, in other words taken to a conversion house and transferred there, it will go to analog before it goes to 1630.

Mix: At what point does Dolby B encoding take place, and will it be done digitally?

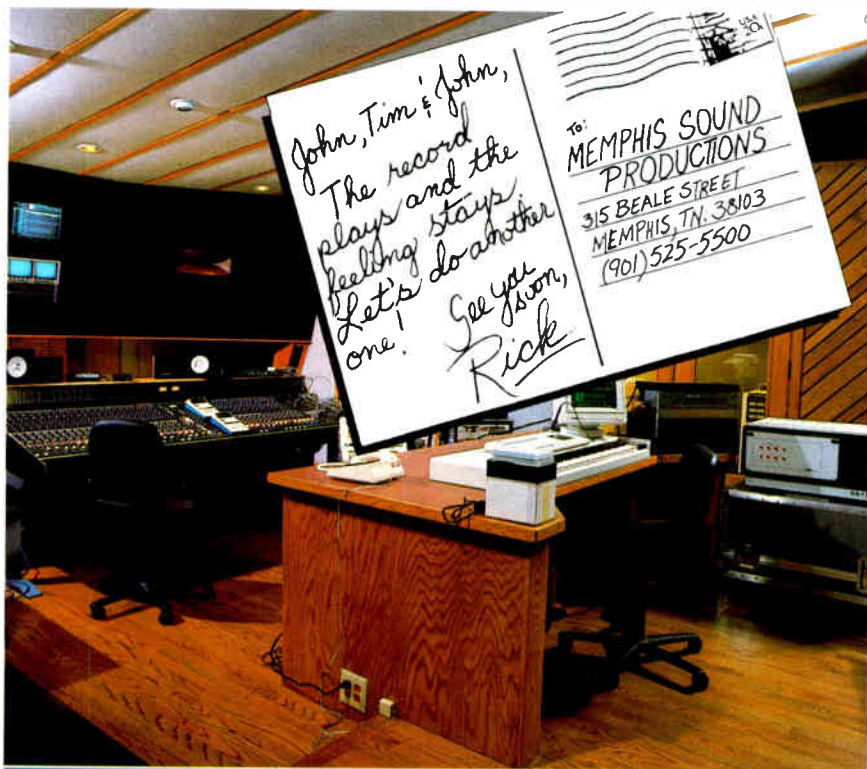
AMI: At the point we are right now, we are doing the Dolby encoding in the analog domain. There are several reasons for this. First of all, in order to call

an encoder a Dolby encoder, it has to be approved by Dolby Labs. And the standard against which that encoder is compared is a standard analog Dolby circuit. Anything you could do in a digital circuit which would vary from that would be unacceptable to them. By whatever means you wish, you have to achieve the exact same results that the analog Dolby system yields now. After talking to Dolby and finding out that all we would be doing is something in the digital domain that is a 100% mimic of what happens in the analog domain, there is nothing to be gained by doing it.

A couple of years ago there was another side to this question. That was that when you brought the digital information out of the digital domain, coming out of a Sony 1610 to go through the Dolby encoder, and then had to reconvert it, there were some significant potential distortions that may have existed due to the filtering inside the 1610. You would be going through two sets of 20 kHz low pass filters, so you would have had a lot of phase shift in the pass band. Then Sony brought out the 1630. It is two times oversampling, so the filtering is now out in the 50 kHz range, and you have virtually no phase shift in the audio pass band. That makes it imperceptible when you go analog and then right back to digital again.

The weaknesses of analog are when you go into a storage medium. But all we are talking about is going analog to go through a piece of electronic gear. If you consider that the final product is analog cassette, with a maximum dynamic range in the Dolby B mode in the mid-60 dBs, the degradation involved in going through one extra set of two times oversampling converters is absolutely insignificant. If the 1630, with the two times oversampling, had not come out, then this question of how you Dolby encode would have been a major issue. But digital Dolby doesn't make a whole lot of sense anymore.

You also have to look at another factor. The toughest part of this whole project is that the output of the digital bin has to have an incredibly fast D to A converter. There is no way with present technology that you are going to make a 16-bit D to A that works at a 64:1 dupe ratio that has two times oversampling. So you are going to have a very steep cutoff filter at the output of



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your bin, with a lot of phase shift in the pass band. That is going to more than overshadow any phase shift introduced by an extra 1630 conversion in the mastering process.

Finally, look at the size of the market. You may sell a major duplicator ten or 12 digital bins. But he only needs one or perhaps two digital Dolby units. They go in his mastering room, not on his bins. So it's not a commercially sound product, either.

Mix: Does the program material get entered into the system's memory in real time?

AMI: At this point it gets dumped into the memory in real time. We are in development with a high speed loading process, but we are not very far along with it. The process we are shooting for should load at a ratio of about 10:1. Because you could load both sides simultaneously, that's an effective ratio of about 20:1, which means that a C-45 could be done in a couple of minutes.

Mix: In the version that is to be marketed initially, will the bin be off-line while the memory is loaded?

AMI: It is intended that you would have a pair of digital master bins if you did not want to pull the system off-line while loading. Right now in a typical duplication house where volume is the most important factor, a line of slaves will always be connected to two masters. So while they are loading one master tape they can be running the other bin. They just switch back and forth. So that is how our system will probably end up being.

Mix: What type of storage is used for the audio data?

AMI: RAM proved to be way too expensive. The other alternatives are not many. Most optical disks, though they have a large storage capacity, are not very fast in transfer. The other alternative is a rigid magnetic disk. We are using a multiple platter hard drive, but it has some significant differences in its design from the Winchester drive. It is something we had custom-built for us by a manufacturer that specializes in building military hardware. There is a unit very similar to it that is working for the U.S. Air Force in a flight simulator where they need extremely high data transfer rates. It's your tax dollars that helped pay for the development

of this project.

In the playback mode, we use two drives simultaneously, an A and a B drive. The data transfer rate exceeds 14 megabytes per second per drive, compared to most industrial drives, which operate at about 1.8 megabytes per second. Also, there are a couple of serious flaws with the regular Winchester type technology. Disk drive crashes and media flaws (irregularities in the oxide coating of the disk) are fairly common. Not a lot of care is typically given to correcting these problems, because a computer is usually laying down redundant information and has plenty of time to go through an error checking routine. But we don't have the time for that. We have to bring up and process a whole new word for each channel every 300 nanoseconds. So we had to develop an error free drive.

We have a circuit that looks up the address of the hard disk track onto which you are trying to record, and it compares that address with a list of those tracks that are known to have media flaws. If the address is on that list, the drive automatically records the information on a different track.

We also have spare heads which the system can switch to at any instant. We've got tons of backup features because we believe it is better to avoid problems in advance than to have to spend a tremendous amount of effort to try to correct them afterwards. It's more expensive initially, but it's the only practical way to achieve what we have achieved. So we have a zero defect disk drive, which behaves exactly like a large RAM memory because we can write to it at a reasonable speed and read from it at an incredibly high speed.

Mix: Is the data for the B side of the cassette pulled out of memory backwards to allow running both sides simultaneously?

AMI: No. It is actually recorded into memory backwards. It's easier that way because you have a lot more time to do it. On the A side we record from the outside of the disc to the inside. On the B side we record from the inside out. When we go to play them, we start at the outside and move in on both sides.

Mix: At how many times real time will the master be able to feed program to



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the slaves?

AMI: The standard dupe speed is 64 times. We are also finishing up development of an 80 times dupe option. If you have Gauss or Electrosound slaves, we will supply the necessary conversions to change your slaves to 80:1. That's a 15% productivity increase. You could pay for the bin alone just with your productivity increase, even if quality doesn't matter to you. We will be at the AES show doing duplicating on the floor at 80:1.

Mix: Some of those who I have spoken to in the past about digital bin masters have expressed concern about the accuracy of D to A conversion at speeds as high as 64 times real time. How have you been able to deal with this problem?

AMI: 64:1 does present a formidable obstacle if you are in the tape business. But if you are involved in building military hardware, you just have to know where to find stuff like that. The government is years ahead of the tape business. If you get into where the serious bucks are being spent on modern technology, you would be surprised to see what is used in the military every day. You can find the companies that make something similar to what you want that, with some modifications, can be turned into exactly what you want.

Our D to A converter was almost off the shelf, but to use it at the speeds we wanted we were pushing it to its design limit. We talked to the designer of the part, and he hand selected the components we are using. A digital bin only needs four converters, so it really doesn't matter how much they cost. When you are talking about something the price of a digital bin, every single D to A can be hand-built and trimmed by an engineer. If it had been up to the tape industry, we would probably have been waiting until the next century, but the military has a pretty big budget for this kind of stuff.

Mix: Anyone could go to one of these military contractors and do what you have done?

AMI: Sure they could. But they'd better come with a big checkbook.

Mix: How many slaves will you be able to feed from the digital bin?

AMI: That is only limited by how much wire you can afford. We have buffered line drivers that can drive an almost unlimited number of slaves. We furnish our own line amplifiers that have a slew rate of 3,000 volts per micro-second.

Mix: When will the DAAD system be available for commercial sale?

AMI: We are scheduled to deliver the first unit right after the AES show. We intend to begin delivery of the first ten units, according to contract, in the first quarter of 1988.

Mix: How much are the units likely to cost?

AMI: We came to the conclusion a long time ago that \$100,000 was the magic number. We figured that if we could do it for that price we would have a commercially viable product. We finally got it to the point where we can sell it for 100 grand and make some money, and we think that people who are really serious about quality will be able to afford to buy it. And for people who have to have productivity increases to justify it, we offer the 80:1 dupe option.

Mix: Are you making any attempt to encourage those who buy DAAD systems to use a particular logo or other indication on the packaging of the cassettes so that consumers will be able to tell that this process is being used?

AMI: Not at this point. It is entirely up to the end user of the system. The stuff that we do ourselves is going to have the DAAD trademark on it.

Mix: How do you think the future of your system might be influenced by the introduction of DAT?

AMI: We don't think this is going to have a whole lot of effect on DAT or vice versa. When people find out just how good the analog cassette can be if the process is right, it will serve to prolong the future of the analog cassette a lot longer than we have ever dreamed. ■

Phil De Lancie is one of our resident experts on topics relating to record mastering and manufacturing, tape duplication, CD replication, storage and formats. He's also a mastering engineer at Fantasy Recording Studios in Berkeley, right across the street from the Mix offices.

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PHOTO: DDA AMR24 CONSOLE AT WHITE FIELD STUDIOS, SANTA ANA, CA



NEW PRODUCTS

AMPLIFIERS

1988



AB INTERNATIONAL ELECTRONICS, INC.
Precedent Series Model 1100A

AB INTERNATIONAL ELECTRONICS, INC.
1830-6 Vernon St.
Roseville, CA 95678
(916) 783-7800

Product Name: Precedent Series Model 1100A
Contact: Irwin Laskey (714) 951-7435
Date Product Introduced: June, 1987

Product Description & Applications: AB International's 1100A is a state-of-the-art dual channel audio power amplifier designed for multi-usage professional applications. The AB 1100A employs leading technology in both circuitry and packaging. The 1100A utilizes AB's "logic operated gated output" for unparalleled levels in performance, reliability and value.
Basic Specifications & Suggested List Price: 2-channel audio power amplifier, 500 watts per channel at 8 ohms, 750 at 4 ohms, distortion less than 0.01%; full protection including DC fault, "logic" operated gated output." 5.25"H, 19"W, 11 1/4", 13 3/4" overall 40 lbs

AMR (AUDIO MEDIA RESEARCH)
PO Box 1230
Meridian, MS 39301
(601) 483-5372

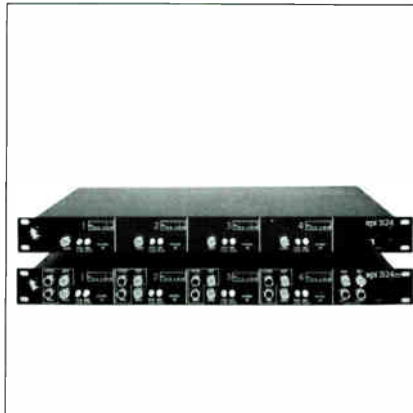
Product Name: PMA 70 Plus (Stereo Power Amplifier)
Contact: Ken Valentine, product manager
Date Product Introduced: June, 1987

Product Description & Applications: A newly designed "driven" power supply allows the PMA 70 Plus to provide 35 watts RMS per channel continuous output power and an impressive 100 watts per channel instantaneous power. The small package and 100-watt headroom capability make this new amplifier the ideal choice for near-field reference monitor amplifications where studio rack space is at a premium. Two PMA 70 Plus amplifiers racked side-by-side yield four 100-watt channels of power in only three rack spaces.
Basic Specifications & Suggested List Price: Suggested U S list price \$179.50

API AUDIO PRODUCTS
7951 Twist Lane
Springfield, VA 22153
(703) 455-8188

Product Name: 3124 Mic Preamplifier
Contact: Paul Wolff, Jim Wallace
Date Product Introduced: June 1, 1987

Product Description & Applications: The new API 3124 Mic Preamplifier incorporates four API 312 mic pre cards into one single rack space self-powered unit. The unit features balanced XLR connections on the rear, unbalanced high-Z 1/4" inputs on the front, gain control, LED metering, 20 dB pad,



API AUDIO PRODUCTS
3124 Mic Preamplifier

Jensen input transformers and all discrete circuitry with the API 2520 discrete op-amp. The 3124M (mixer) takes the above and adds a stereo mix bus with master level controls, level and pan controls, an insert jack for each input and an aux bus with send level for each channel, master send and stereo return with panner.

Basic Specifications & Suggested List Price: 3124 four-channel version \$1,750, 3124 two-channel version (upgradeable) \$1,270, 3124M mixer version \$2,250, other options available. Call for details

BENCHMARK MEDIA SYSTEMS, INC.
3817 Brewerton Rd.
N. Syracuse, NY 13212
(315) 452-0500

Product Name: HPA-1 Headphone Amplifier
Contact: Allen H. Burdick, pres.
Date Product Introduced: April, 1987

Product Description & Applications: Panel mount jack (TRS) with attached 1-watt/channel headphone amp and stereo volume control. For custom or retrofit installation anywhere an audio monitor is required. Requires ±15-volt power, has two unbalanced audio inputs. Ideally suited for 600-ohm studio headphones, however will drive all headphones 8 ohms or greater.

Basic Specifications & Suggested List Price: Price \$55.66 1-11 pieces, \$50.09 12 pieces or more

BGW SYSTEMS, INC.
13130 S. Yukon Ave.
Hawthorne, CA 90251
(213) 973-8090

Product Name: BGW GTA Grand Touring Amplifier
Contact: Brian Wachner, president
Date Product Introduced: June, 1987

Product Description & Applications: The GTA is the most powerful amplifier ever built by BGW. Built to withstand the most rigorous applications such as road shows and sub-bass systems. Actually two independent units, each with its own power supply, power cord and magnetic circuit breaker but sharing the same welded steel chassis. With its enormous energy storage and low feedback discrete circuitry, it gives excellent sonic performance while delivering unbelievable punch at less than \$1/watt!

Basic Specifications & Suggested List Price: 2 4 horsepower, dual power supplies, active balanced inputs, subsonic filters, forced air-cooled. Options available include electronic crossover card and isolated input transformers. Built in DC speaker protection, oversized indicators, modular construction. Suggested list \$1,799

CREST AUDIO
150 Florence Ave.
Hawthorne, NJ 07828
(201) 423-1300

Product Name: FA 800 Amplifier

Contact: Craig Hannabury, division manager
Date Product Introduced: November, 1986

Product Description & Applications: The FA800 incorporates the technology and construction found in Crest's larger amplifiers into a very cost-effective, small package. Standard features include modular construction, forced air-cooling, balanced inputs on XLRs and 1/4" jacks, clip LEDs, full relay protection from DC, shorts, opens, turn on and off thumps and thermal overload.

Basic Specifications & Suggested List Price: 210 watts per channel at 8 ohms, 335 watts per channel at 4 ohms, 700 watts bridged into 8 ohms. Slew rate: 40V/μs; damping factor: 350:1 at 8 ohms; THD < 0.5%, IMD < 0.1%; noise: 100dB (A weighted); input sensitivity: 1.0V; size: 19" x 13" x 3.5"; weight: 32 lbs. List price: \$792



CREST AUDIO
8001 Professional Power Amplifier

CREST AUDIO
150 Florence Ave.
Hawthorne, NJ 07828
(201) 423-1300

Product Name: 8001 Professional Power Amplifier
Contact: Craig Hannabury, division manager
Date Product Introduced: May, 1987

Product Description & Applications: The 8001 is the highest power three-space, full-range amplifier available. New features include IGM gain limiting, over-voltage clip limiting and a fully discrete front end circuit. The unit is completely modular with all active components on two heatsink modules for extremely easy servicing. Designed principally for road and studio use, the 8001 uses a 14-gallon steel box chassis and a 1/4" front panel. Connectors include parallel XLRs and output binding posts on each channel.

Basic Specifications & Suggested List Price: 750 watts per channel at 8 ohms, 1,200 watts per channel at 4 ohms, 1,400 watts per channel at 2 ohms, both channels driven 20-20kHz. Slew rate: 60V/μs; damping factor: 400:1 at 8 ohms, THD < 0.5%, IMD < 0.5%, noise: 106dB, A weighted; input sensitivity: 1.75V (standard); size: 19" x 15.5" x 5.25"; weight: 80 lbs.

DUKANE CORPORATION
2900 Dukane Dr.
St. Charles, IL 60174
(312) 584-2300

Product Name: Power Amplifier Models 1A3060/1B3060, 1A3125/1B3125
Contact: Jeff de Lacey, account executive
Date Product Introduced: Fall 1986

Product Description & Applications: Reliable industrial/commercial power amplifiers for public address, background music, sound management applications in schools, stores, hospitals, factories, stadiums, offices, hotels, etc. Amplifiers are equipped with electronic protection and thermal circuit breakers. Models 1B3060 and 1B3125 include circuitry for 24VDC battery backup.

Basic Specifications & Suggested List Price: Rated capacity 60 and 125 watts continuous (RMS) power, less than 5% distortion over full bandwidth; frequency response 45 to 20kHz at rated output +0, -1 dB, 5 1/4" H x 19" W x 6 1/4" D, mounts easily in all standard 19" racks. Suggested list Model 1A3060 \$537.50, Model 1B3060 \$650, Model 1A3125 \$662.50, Model 1B3125 \$837.50

ELECTRO FORCE CORP.
727 Oakstone Way
Anaheim, CA 92806
(714) 774-3666

Product Name: Electro Force 450-SR Power Amplifier
Contact: Phillip Lindberg, president
Date Product Introduced: January, 1987



ELECTRO FORCE CORP.
Electro Force 450-SR Power Amplifier

Product Description & Applications: The stereo 450-watt, model 450-SR, is the latest in switch-mode digital technology. At a mere 13 pounds, it is one of the lightest and most compact in the industry, saves on shipping costs and is ideal for musicians on tour or traveling DJs. True pulse width modulated (PWM) MOSFET output stages allow for an operating efficiency of 90% compared to 30% for linear amps. Cool operation and low power consumption are assured without noisy fans.

Basic Specifications & Suggested List Price: Power output stereo 225 watts RMS/Ch, frequency response 20Hz to 20kHz, distortion 0.2% typical, noise level 90 dB below rated output, input impedance 10k ohms balanced, input sensitivity 1.0 V RMS for full output, chassis size 3.5" H x 19" W x 7.5" D, weight 13 pounds, list price \$579.

FM ACOUSTICS LTD. (USA)
PO Box 854
Benicia, CA 94510
(707) 745-4444

Product Name: FM216 Precision Line Level Interface
Contact: Gene Michalski

Date Product Introduced: January, 1987 (AES London)
Product Description & Applications: The FM216 complements the FM214 in all applications where a true precision step-down unit is required. It incorporates a fixed attenuation of 14 dB which is internally adjustable between 7 dB and 60 dB. Its design includes all the precision FM Acoustics features making it, with the FM214, the perfect interface combination capable of resolving any difficult level or impedance problem. Their use extends from recording studios to the most demanding applications of audio-video post-production, broadcast and public address.

Basic Specifications & Suggested List Price: Class A technology. No transformers or ICs in audio path. Delayed turn-on 50-ohm input impedance. Separate power supply. Absolute stability over long lines. Special short circuiting output connectors. Price \$820.

DAVID HAFNER CO.
5910 Crescent Blvd.
Pennsauken, NJ 08109
(609) 662-6355

Product Name: P-230

Contact: R.H. Tucker, dir. mktg. serv.

Date Product Introduced: March, 1987

Product Description & Applications: 120-watt/channel MOSFET power amplifier with high current output stage capability. Exceptional performance into low impedance and difficult speaker loads—up to 280 watts into 2 ohms (per channel). Balanced input option available. Provision for mounting 70-volt line transformers. Also available in kit form.

Basic Specifications & Suggested List Price: 120 watts/channel at 8 ohms at < 0.02% THD. IMD below 0.005% at rated power at 8 ohms. S/N ratio more than 100 dB below rated power. Retail \$560 assembled, \$485 kit.

JENSEN TRANSFORMERS, INC.
10735 Burbank Blvd.
North Hollywood, CA 91601
(213) 876-0059

Product Name: Jensen Twin Servo Microphone Preamp
Contact: Deane Jensen

Date Product Introduced: June, 1987 (first piece delivered)

Product Description & Applications: Deane Jensen's best microphone preamp design is now available in a self-powered rack mount or portable package. The 3 1/2" rack unit can house 2, 4 or 6 channels with power supply. The portable "half-rack" version has 2 channels. The Jensen Twin Servo Mic Pre has won 50 independent listening tests by recording engineers who have "tried them all."



JENSEN TRANSFORMERS, INC.
Jensen Twin Servo Microphone Preamp

Basic Specifications & Suggested List Price: Gain 18 to 60 dB, response 0.4 Hz to 140 kHz, noise 128.7 dBu, phase within 2 degrees 20 kHz to 120 kHz, group delay flatness within 0.25 US 2 kHz to 120 kHz. Pricing: 2-channel half-rack \$1,797, 2-channel full-rack \$1,937, 4-channel \$3,060, 6-channel \$4,183.

KMD SOUND ELECTRONICS

PO Box 507

Bloomfield, CT 06002

(203) 243-7888

Product Name: RP500S Stereo Power Amplifier

Contact: Bud Mayer, elec. prod. mgr.

Date Product Introduced: July, 1987

Product Description & Applications: Two-channel, linear power amplifier which combines audiophile performance with electronic and mechanical design features to ensure utmost reliability and roadworthiness. Features include "Auto Bias" circuit to insure temperature stability, "Undriver" output for controlled current flow, short circuit, thermal and DC protection. Covered by KMD's unique 2+2 warranty. Two years unconditional (repair or replace) and two years standard KMD warranty.

Basic Specifications & Suggested List Price: 250 watts/channel at 4 ohms, 20 Hz-20 kHz freq. response, +/-1-0.5 dB, slew rate 30V/μs, variable speed fan, speaker connections via 1/4" jacks or binding posts, two-unit spacing for 19" rack mounting, dimensions 19" x 13 1/2" x 3 1/2", weight 37 lbs., 10 oz. Suggested list \$699.50.

LAKE PEOPLE

Rosgartenstr. 13

D-7750 Konstanz, Germany

D(07531) 24428

Product Name: Phoneamp V6

Contact: Fried. Reim, tech. director

Date Product Introduced: December, 1986

Product Description & Applications: The Phoneamp V6 is a 2-channel amplifier with a low distortion in a very small housing. Its impedance is optimized to drive up to six pluggable high quality headphones. These may be manipulated in five different ways. Overload is indicated by an active-driven clip LED. Thanks to the built-in 1/8" thread in the ground plate the Phoneamp V6 can be mounted on every microphone stand and is to be operated where it is needed.

Basic Specifications & Suggested List Price: Input asym. impedance 10k ohm, sensitivity -10 dB, frequency range 25Hz-40kHz, max. output > +20 dB in RL > 100 ohm, distortion < 0.05%, dynamic > 100 dB, connectors {8} 1/4" phone-jacks, 2 in, 6 out, dimensions W 154, H 94, D 102mm, supply 110- or 220-volt. Price \$358.

LEITCH VIDEO OF AMERICA INC.

825K Greenbrier Circle

Chesapeake, VA 23320

(804) 424-7920

Product Name: FR-880 Series Distribution Equipment

Contact: Gary Stephens, technical support & sales

Date Product Introduced: April, 1987

Product Description & Applications: Complete family of audio distribution amplifier frames (6) and distribution amplifiers. Available in 6 or 8 outputs and in 600, 150 or 66 ohm versions. Also available is an audio tone generator for the distribution family.

Basic Specifications & Suggested List Price: Frames FR-881—1RU, 4 audio DAs solder terminals, FR-882—2RU, 12 audio DAs solder terminals, FR-883—1RU, 4 audio DAs screw terminals, FR-884—2RU, 12 audio DAs screw terminals, ADA-880—8 outputs, 600 and 150 ohm output, ADA-881—8 outputs, 66 ohm output.

LENCO, INC.
300 N. Maryland
Jackson, MO 63755
(314) 243-3147

Product Name: MPA-2300 Monitor Power Amplifier

Contact: Jim K. Rhodes, product mgr.

Date Product Introduced: January, 1987

Product Description & Applications: The MPA-2300 is designed and built to give highest quality performance, with ample wattage to drive the bigger systems in a light, manageable unit. Problems associated with compact, high-watt amps have been eliminated. Its unique cooling system and specially designed power supply support the heaviest demands. Slew rate, damping factors and THD specifications are among the highest obtainable. Five safety-protection features, along with a 5-year warranty help protect the owner's investment.

Basic Specifications & Suggested List Price: Power 400 watts RMS/ch, 4 ohms/1,450 watts peak pulse, mono, 8 ohms, THD less than 0.03% up to clipping, slew rate 300 V/μs, 8 ohms, damping factor over 900 (up to 5kHz), dimensions 19" x 3 5/8" x 17", weight 33 lbs., purchase factory direct (for professional end-users only).

PANASONIC RAMSA

6550 Katella Ave.

Cypress, CA 90630

(714) 895-7277

Product Name: Model WP-9440 400-Watt/Channel Power Amplifier

Contact: Steve Woolley, sales & mkt. mgr.

Date Product Introduced: October, 1987

Product Description & Applications: Very high output power amplifier for professional, touring and commercial sound application. U.L. listed, five-year limited warranty. Can drive very low-impedance, highly reactive loads at full power while maintaining exceptional sound quality. "Soft overload" characteristics, low-feedback design, unobtrusive protection circuitry and exceptionally large "safe operating area" output devices. 20/40Hz switchable high-pass, dual power supplies. telemetry outputs, low-profile 5 25" rack mount package.

Basic Specifications & Suggested List Price: Rated power output 8 ohms/ch > 400 watts, 4 ohms/ch > 700 watts, 2 ohms/ch > 1,000 watts, 4 ohms mono/bridge > 2,000 watts, frequency response -3 dB at 3Hz and 80kHz at 4 ohms, rated output, slew rate > 60V/μsec, distortion < 0.05% 250mW to rated power at 8 ohms, 20-20kHz, S/N ratio 100 dB below 400 watts/8 ohms, suggested retail \$2,100.



POWER SOLUTIONS, INC.
PS-2000 Digital Bass Amplifier

POWER SOLUTIONS, INC.

10681 Haddington, #190

Houston, TX 77043

(713) 932-9847

(800) 345-9130

Product Name: PS-2000 Digital Bass Amplifier

Contact: Glenn Messerschmitt, marketing manager

Date Product Introduced: April, 1987

Product Description & Applications: The PS-2000 Digital Bass Amplifier is used specifically for demanding high power/low frequency sound reinforcement. The amplifier is capable of providing 2,000 watts "continuously" into a 4-ohm speaker system and has a frequency response of 6 to 1,000Hz. Its MOSFET-driven outputs produce a 90% efficiency rating compared with the 50-70% efficiency of conventional amplifiers. The PS-2000 is ideal for tour companies, clubs, stadiums, or any other installation requiring high power bass amplification.

Basic Specifications & Suggested List Price: The PS-2000 will drive any load, resistive or reactive. The signal input may be 600 ohms or Hi-Z (switched), balanced or unbalanced grounded or floating (switched). The PS-2000 weighs only 27 lbs. and resides in two standard rack spaces (3 5/8" H x 19" W x 17" D). Suggested list price is \$1,895.

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NEW PRODUCTS

AMPLIFIERS

1988

POWERTRONIX
 10623 Lawson River Ave.
 Fountain Valley, CA 92708
 (714) 963-5411

Contact: William G. Organ, sales manager
 Date Product Introduced: April, 1987
 Product Description & Applications: Power amplifier with unique circuitry that makes it completely short-out proof. The amplifier will continue to deliver current to the load even with a direct short across the output. Available with battery backup and 70V line output. Applications include emergency voice Evac for commercial installations such as schools, stadiums, high rise buildings, night clubs and churches. Made in the USA

Basic Specifications & Suggested List Price: 250 watts continuous power (AC or DC) 70-volt line output 600-ohm balanced input. DC current consumption (idle) 30 Ma. THD less than 1% at full output

QSC AUDIO PRODUCTS, INC.
 1926 Placentia Ave.
 Costa Mesa, CA 92627
 (714) 645-2540

Product Name: MPS 2300
 Contact: Greg McVeigh, national sales manager
 Date Product Introduced: June, 1987
 Product Description & Applications: The MPS 2300 is an integrated music and paging system with two independent power amplifiers, two microphone inputs for paging, four music inputs, two auxiliary inputs and full remote control capabilities for paging volume, music volume and music source

Basic Specifications & Suggested List Price: Power amplifiers: zone A & B—125 watts each at 8 ohms, 175 watts each at 4 ohms, 150 watts each at 70 volts; 19" wide (optional rack ears), 5.25" (3 rack space high)

RENKUS-HEINZ, INC.
 17191 Armstrong
 Irvine, CA 92714
 (714) 250-0166

Product Name: P-1500 Power Amplifier
 Contact: Russ Farrell, director of marketing
 Date Product Introduced: March, 1987
 Product Description & Applications: The P-1500 amplifier from Renkus-Heinz features power-guard circuitry to protect speakers from high frequency oscillation and hard clipping. Back to front forced air cooling allows high output from an amplifier only two rack spaces high

Basic Specifications & Suggested List Price: Output per channel: 500 watts into 4 ohms, 300 watts into 8 ohms, 750 watts into 2 ohms, 1,500 watts bridged into 4 ohms. THD 20Hz to 20kHz better than .04% at 4 ohms. Slew rate greater than 40V per microsecond. Size 3.5"H x 19"W x 13.75"D. Weight 40 Suggested resale \$1,598



RICKENBACKER INTERNATIONAL CORP.
 RA300 and RA600 Professional Power Amplifiers

RICKENBACKER INTERNATIONAL CORP.
 3895 S. Main St.
 Santa Ana, CA 92707
 (714) 545-5574
 Product Name: RA300 and RA600 Professional Power Amplifiers

Contact: Shirley Swanson, sales coordinator
 Date Product Introduced: October, 1986
 Product Description & Applications: Ultra high quality power amplifiers with fault tolerant features in EIA standard rack mount for studio, stage, sound reinforcement and permanent installations. A joint product venture from 58-year-old Rickenbacker and Sony Sound Tec offers unparalleled reputation for quality and reliability. Sealed toroidal transformer, XLR as well as phone connectors, power output metering (RA600) and IEC dual voltage 110/120 are standard. Superbly rugged chassis with low weight design

Basic Specifications & Suggested List Price: Independent test lab specs. list price RA600 = \$1,249, RA300 = \$899; power/channel RA600 440 = at 4 ohms, RA300 = 220 at 4 ohms, power/bridged: RA600 = 1196 at 4ohms, RA300 = 552 at 4ohms, THD 0.05% at full rated power output, slew rate 52 avolts/microsecond; power bandwidth 20Hz-30kHz at full rated output; signal/noise -110 dB unweighted

ROSS SYSTEMS
 PO Box 2344
 Ft. Worth, TX 76113
 (817) 336-5114

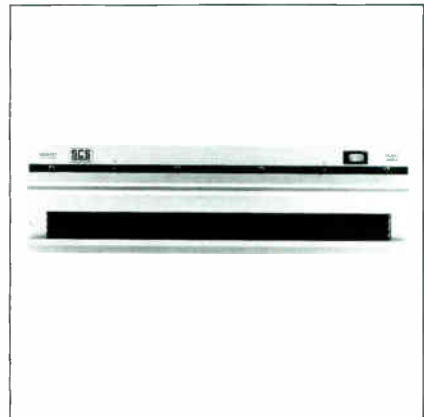
Product Name: Mega Amp 800 Power Amplifier
 Contact: Harvey Gerst, director
 Date Product Introduced: June 27, 1987
 Product Description & Applications: High power stereo amplifier for professional sound reinforcement monitoring. Very rugged design with massive heatsinks, oversize power transformer, built-in peak limiting and speaker protection circuits. Switchable for mono "bridge-mode" operation. Input level controls, LED clipping indicators. Five-way binding post Output connectors 5/4"H x 19"W x 12 1/2"D

Basic Specifications & Suggested List Price: Power bandwidth is 7Hz to 40kHz at -3 dB points, damping factor at 8 ohms is greater than 250, hum and noise better than -104 dB referenced to 200 watts output, power output at 0.1% THD and IM is 400 watts per channel at 4 ohms, 200 watts per channel at 8 ohms and 650 watts bridged into 8 ohms. Suggested retail \$799.95.

ROSS SYSTEMS
 PO Box 2344
 Ft. Worth, TX 76113
 (817) 336-5114

Product Name: Mega Amp III-600 Power Amplifier
 Contact: Harvey Gerst, director
 Date Product Introduced: June 27, 1987
 Product Description & Applications: Compact, 3-channel power amplifier for professional sound reinforcement applications. Provides three fully independent amp sections in only 3 EIA rack spaces. Ideal for bi-amp speakers, monitors, delayed systems. Separate meters and LED clipping indicators for each amp section. Front panel level controls, power switch. Full complement of protection circuits for reliability

Basic Specifications & Suggested List Price: Freq. response: 5Hz to 50kHz; slew rate: 30 volts/microsecond. Power output for 0.1% THD and IM is 200 watts each section at 4 ohms load, 140 watts at 8 ohms. Suggested retail \$649.95.



SCS/SOUND CODE SYSTEMS
 SCS Model 2600A

SCS/SOUND CODE SYSTEMS
 PO Box 2198
 Garden Grove, CA 92642
 (714) 554-0903

Product Name: SCS Model 2600A
Contact: Tim Edwards, sales manager
Date Product Introduced: March, 1987
Product Description & Applications: The SCS Model 2600A is a dual channel audio amplifier designed for concert sound, recording and permanent installations. The output stage is MOSFET, coupled to a dual power supply designed to deliver high current into reactive loads without current limiting. The entire unit is fan-cooled, front to back. The front end electronics are fully discrete with a true differential input stage (bal or unbalanced). The front panel is a heavy-gauge aluminum extrusion designed to offer support on all axis, as well as act as the transport handle.
Basic Specifications & Suggested List Price: Power output is 350 watts/channel/8 ohms and 600 watts/channel/4 ohms. Slew rate is 70V/microsecond. Damping is +350, 20Hz-20 kHz. Freq. response is +0/-3 dB 10Hz-175kHz. Distortion at full power, 8 ohms is 0.1% THD and 0.25% IMD. Dimensions are 5'25" x 19" x 12'5". Weight is 49 lbs. Price is \$1,099 U.S.



STEVEN ELECTRONICS
 Steven Power Amplifiers PA-220 & PA-420

Product Description & Applications: Offered in two 19" rack mount formats, a 1 x 100 watt and 2 x 200 watt, the Steven PA-220 and PA-420 offer the consumer cost-effective yet reliable stereo power amplification. Both units feature separate left and right channel gain controls with LED clip indicators.
Basic Specifications & Suggested List Price: PA-220 rated output, 100w/channel at 8 ohms, 20-20kHz, less than 0.2% THD. PA-420 rated output, 200w/channel at 8 ohms, 20-20kHz, less than 0.2% THD.

STEVEN ELECTRONICS INC.
 PO Box 60317
 Sacramento, CA 95860
 (916) 635-3011
Product Name: MP-2
Contact: James M. Ruse, national sales manager
Date Product Introduced: April 1, 1987
Product Description & Applications: The MP-2 is a low Z single channel microphone preamp that will allow users to send signal direct to tape. The MP-2 is also ideally suited for commercial installations and broadcast applications where a single channel mic preamp is needed. The MP-2 has been

designed to include those features most commonly found in elaborate mixing consoles.
Basic Specifications & Suggested List Price: The MP-2 is made rack-mountable through use of Stewart's own RMK-1 or RMK-2 rack mount kits (sold separately). The unit also includes 3-band active EQ with sweepable mid, 48-volt phantom power, 20 dB input pad and switchable output phase inversion. Suggested retail is \$399.

STEWART ELECTRONICS INC.
 PO Box 60317
 Sacramento, CA 95860
 (916) 635-3011
Product Name: UDP-2
Contact: James M. Ruse, national sales manager
Date Product Introduced: April 1, 1987
Product Description & Applications: The UDP-2 is a low noise, rack-mountable preamp that can drive any signal level from acoustic guitar to line level. A specially designed filter allows natural response from acoustic instruments. The UDP-2 also contains a switchable effects loop which will allow easy interface with other outboard gear. The unit is powered by the Stewart PS-1 AC supply (included).
Basic Specifications & Suggested List Price: The UDP-2's specs and features include active 3-band EQ with sweepable MIDI, EQ defeat switch. Both hi-z and lo-z outputs with switchable level (-30, -10, +4) and wide 20Hz to 20kHz bandwidth. The UDP-2 carries a suggested retail price of \$399.

STUDIO TECHNOLOGIES, INC.
 5520 W. Touhy Ave.
 Skokie, IL 60077
 (312) 676-9177
Product Name: Mic-PreEminence Microphone Preamplifier
Contact: Jennifer Shore, mktg. asst.
Date Product Introduced: October, 1986
Product Description & Applications: The Mic-PreEminence is a self-powered dual microphone preamplifier. Its level of technical and sonic performance are virtually unmatched due to the mic preamps low noise, low distortion and high speed design. The Mic-PreEminence is useful in any application where complex analog signals tax the capabilities of current microphone preamplifiers. Application examples include minimizing signal flow through a console and digital sampling.
Basic Specifications & Suggested List Price: Designed to be

—CONTINUED ON NEXT PAGE

A Judgement Rendered on LENCO AMPS



"Performance specifications alone won't reveal all one needs to know in determining the merits or the deficiencies of a power amplifier; but when we found one that had a slew rate of 300 V/μs (8 Ohms), a damping factor that hits the 1000 mark - all the way up to 5 KHz, and a THD of .003%, it came as no surprise to us to find this same level of superb quality in every other department we evaluated on the LENCO MPA POWER AMPLIFIER."

"Its greatest attribute was discovered at the listening tests. This amp brought a dimension in realism, depth, and accuracy to our monitor system none of us had heard before. From the lowest bottom end, through the midrange, and up through the highs, a new clarity and 'openness' revealed every detail of the recorded material. This allowed making evaluations on EQ and dynamics control much easier!"

"I have chosen the MPA-2300 model LENCO AMP for my personal use. It has become my trusted companion in every recording session I engineer. I can trust it to reveal everything I need to know and hear at the console!"

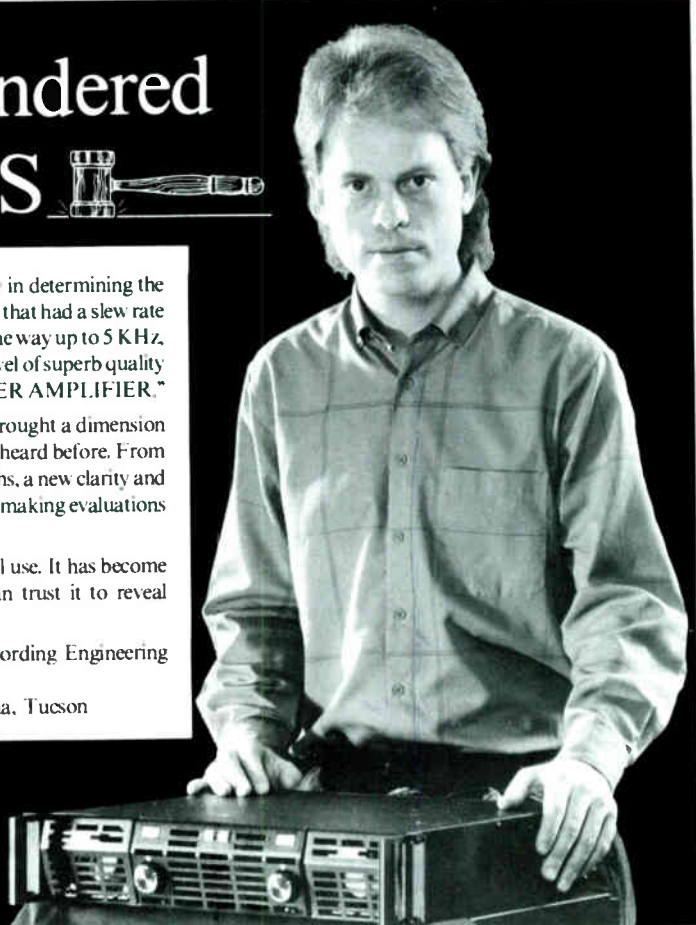
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 University of Arizona, Tucson

(Uncompensated
 Endorsement)

FOR MORE INFORMATION CONTACT:



Jim Rhodes/LENCO, INC.
 P.O. Box 348, 300 N. Maryland
 Jackson, MO 63755
 Phone: 314/243-3147



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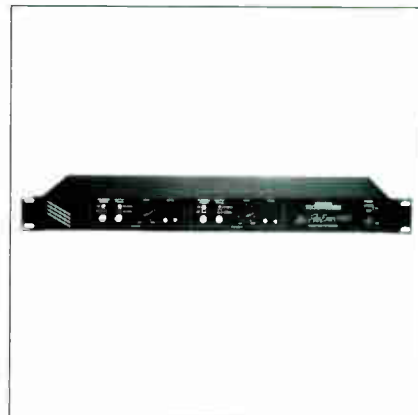
Circle #187 on Reader Service Card

NEW PRODUCTS

AMPLIFIERS

1988

—CONTINUED FROM PAGE 235



STUDIO TECHNOLOGIES, INC.
Mic-PreEminence Microphone Preamp

the ultimate interface between analog microphones and digital recorders, this unit operates as an in-and-out transformer-less, balanced preamp. Along with its exceptional specifications and phantom power, a useful signal indicator and a trim control are provided. Suggested retail price is \$795

3RD GENERATION

431 Hwy. 165
Voluntown, CT 06384
(203) 376-0433

Product Name: FL1200 Dual Channel MOSFET Amplifier
Contact: Michael Panasuk, president
Date Product Introduced: June, 1987

Product Description & Applications: The powerful FL1200 Dual Channel MOSFET Amplifier was designed to provide a total solution to all sound applications from PA use to studio monitoring to permanent installations. The FL1200 is built to an uncompromising list of specifications, not to a list price. The FL1200's "Soft Start Circuitry" eliminates power surges, while the "Thermaguard System" automatically shuts down the amp before overheating occurs and the "DC Fault Detector" adds protection against voltage drops.

Basic Specifications & Suggested List Price: Power output 625 watts per channel into 4 ohms, harmonic distortion: 0.002% at 1kHz, damping factor: +300, slew rate: 60V/μS, signal-to-noise: -100dB, frequency response: +/-1dB 10Hz-55KHz

YAMAHA INTERNATIONAL CORPORATION
PO Box 6600
Buena Park, CA 90622
(714) 522-9011

Product Name: PD2500 Power Amplifier
Contact: Professional Audio Division
Date Product Introduced: January, 1987

Product Description & Applications: At just 26½ pounds, the Yamaha PD2500 power amplifier offers an impressive 500 watts RMS per channel into 2 ohms, 250 watts into 8 ohms and 1,000 watts into a 4 ohm bridged mono load—all in a compact 3.5" x 19" rack space. Its newly designed high frequency power supply is more stable and better regulated than conventional designs, and Yamaha has increased the switching frequency to 125 kHz for an improvement you can hear, especially in the low frequencies. Forced air cooling and independent dB-calibrated attenuators for precise level balancing are standard features. The PD2500 is Underwriters Laboratories listed.

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AUTOMATION & CONTROL SYSTEMS

1988

ADAMS-SMITH

34 Tower St.
Hudson, MA 01749
(617) 562-3801

Product Name: 2600 A/V Audio-For-Video Editor

Contact: Henry E. Adams, VP sales
Date Product Introduced: September, 1987

Product Description & Applications: The 2600A/V is an audio-for-video editor with edit decision list management, hard disk storage, floppy disk input/output, full keyboard and high resolution color screen display. It now features "C-SOUND" audio-graphic editing. This allows up to one hour of sound on three audio channels to be digitally sampled and displayed. Using techniques similar to video slow motion and still-frame, sync and record points can be located with subframe accuracy without repeated "Trim & try" attempts.

Basic Specifications & Suggested List Price: Full SMPTE/EBU LTC/VITC editing, industry-standard video EDL input, multiple reference/music/effects lists, auto generated audio EDL, up to ten audio/video/film transports. Subframe accurate rehearse/record, offsets, sync points, GPI outputs. 20 MB hard disk, 5" and 8" floppies, 12" monitor, 20 user-definable function keys. Uses standard System 2600 modules for time code and synchronization operations. \$22,550

ADAMS-SMITH

34 Tower St.
Hudson, MA 01749
(617) 562-3801

Product Name: Zeta-Three Audio-Video-MIDI Synchronizer

Contact: Henry E. Adams, VP sales
Date Product Introduced: September, 1987

Product Description & Applications: Zeta-Three is an audio-video-MIDI synchronizer that incorporates tape transport synchronization and control, time code functions, and MIDI-to-time code synchronization, all in one small cabinet. It can lock audio-to-video for mix-to-picture or layback, lock audio-to-audio for track-building, or lock MIDI-to-tape for scoring and sweetening. It can generate and read time code, communicate with computers, and issue event commands with sub-frame accuracy.

Basic Specifications & Suggested List Price: Time code. 24, 25, 29.97, 30.00, DF/non DF, SMPTE/EBU, int/ext/video sync, bal in/out, XLRs, jam/transfer, tape sync full chase, M/S control, factory cables, menu-driven setup, subframe accuracy, auto rehearse/record, subframe events, MIDI IMA spec 1.0, sync, song position pointer, control, MIDI time code outputs, in/out/thru jacks, tempo map storage, interface RS-232/422 serial I/O, price \$2,995

ADVANCED MUSIC SYSTEMS-CALREC

AMS Industries PLC, Billington Rd.
Burnley, Lancashire, BB11 5ES England
(0282) 57011

Product Name: AMS Studio Computer

Contact: John Gluck, sales manager
Date Product Introduced: May, 1987

Product Description & Applications: Fader and cut automation system for mixing consoles. Memorizes fader movements and cut switches for replay and continual update against time code. Snapshots of the fader and cut status can also be taken. Features: join mix, track join and individual fader update. A built-in autolocator controls the tape machine. The mix system can also be run from a time code-only reference. All mix operations are performed in battery-backed RAM for fast operation.

Basic Specifications & Suggested List Price: Up to eight megabytes of RAM can be used to store data from many mixes. Fader movements are frame accurate. Cut switches are accurate to 1/10th frame. Thirty-two fader groups, two levels of grouping, mixes are finally saved on 3.5" floppy disks. Multi-standard time code generator and reader. Price on application.

ALLEN & HEATH BRENELL USA LTD.

Five Connair Rd.
Orange, CT 06477
(203) 795-3594

Product Name: CMPTE

Contact: John Petrucelli, engineering R&D
Date Product Introduced: June, 1987

Product Description & Applications: The AHB CMPTE Interface is the latest in a series of controllers for the CMC line of mixing consoles. CMPTE plugs into the expansion connector on a Commodore 64 or 128, allowing the remote control of any CMC mixer. CMPTE includes a 2046 event SMPTE-based sequencer. CMPTE also produces SMPTE to MIDI conversion, SMPTE-based punch-in/out of various tape machines and SMPTE-based trigger generator. A SMPTE generator is included with frame rates of 24, 25, 30 drop and 30 non-drop available.

Basic Specifications & Suggested List Price: SMPTE generator producing frame rates of either 24, 25, 30 drop and 30 non-drop at +4 or -10 operating levels. SMPTE In accepts these levels and frame rates. MIDI Out generates MIDI start, stop, clock continue and SPP MIDI. In will merge incoming MIDI data with MIDI Out. DIN Sync Out produces 24 pulses per quarter note. External trig produces eight independent 0 to 5-volt logic level outputs.

AMR (AUDIO MEDIA RESEARCH)

PO Box 1230
Meridian, MS 39301
(601) 483-5372

Product Name: SyncController/MCR 4/S

Contact: Ken Valentine, product manager
Date Product Introduced: June, 1987

Product Description & Applications: The AMR SyncController generates and reads all four SMPTE formats and provides powerful transport control for machine synchronization. Programmable events (up to 99) include record punch-in/out cue points, looping and MIDI presets. Other MIDI capabilities include MIDI time clock and song position pointer for MIDI instrument/sequencer synchronization. The SyncController interfaces directly with the new AMR MCR 4/S synchronization-capable 4-track recorder. Adapter cables will be made available to interface the SyncController with other popular multi-track machines.

Basic Specifications & Suggested List Price: Generates/reads 24, 25 and 30 frames per second (drop frame and non-drop frame). Controls one master and one slave machine. Event table can be saved to tape and loaded from tape. Provides remote transport control for master and slave. Up to 99 programmable event points. Rehearse capability for programmed punch-in/punch-out events. Suggested U.S. list price: SyncController \$999.50, MCR 4/S to be announced.

CALREC AUDIO LTD. (CALREC BY AMS)

PO Box 31864
Seattle, WA 98103
(206) 633-1956

E-mail CALREC-US

Product Name: "Tasc" Studio Computer

Contact: Nigel Branwell
Date Product Introduced: May, 1987

Product Description & Applications: Though designed for the unique Calrec UA8000 Music Console, Tasc can be used with any VCA-based console. The system is both an extremely sophisticated automation system and machine management system for both audio and video tape recorders. Tasc was developed using proven computer hardware and software already developed by AMS. Main features: Eight megabytes of battery-supported RAM hold a large number of protected mixes available for rapid comparison and manipulation. Mix-merge capability.

Basic Specifications & Suggested List Price: 1) Flexible fader grouping under software control with any fader available for grouping to two levels. 2) Mix updates can be inserted on any channel "on-the-fly" without creating multiple mixes. 3) Mixes can be saved to 3.5" 3/4 meg floppies. 4) Mixes can be run from time code only reference. Price on application.

CIPHER DIGITAL, INC.

PO Box 170
Frederick, MD 21701
(301) 695-0200

Product Name: Softouch-PC

Contact: Anthony R. Matia, general manager
Date Product Introduced: April 1, 1987

Product Description & Applications: Softouch-PC is a PC-type computer-based audio editing system. Softouch-PC is very similar to the Softouch™, but incorporates the power of the PC-type computers. Softouch-PC will control three Shadow II transport synchronizers thus providing control of four transports. The Softouch-PC also communicates with the CDI-750 time code reader and generator.

Basic Specifications & Suggested List Price: Softouch-PC is equipped with an interface card-keyboard, an operational software for PC-type computers. The price of Softouch-PC is \$2,195. Customer must supply computer.



JL COOPER ELECTRONICS
MAGI (Mixer Automation Gain Interface)

JL COOPER ELECTRONICS

1931 Pontius Ave.
Los Angeles, CA 90025
(213) 473-8771

Product Name: MAGI (Mixer Automation Gain Interface)

Contact: A. Khan, sales manager

Date Product Introduced: November, 1986. Los Angeles AES

Product Description & Applications: Automates 16 to 56 channels of fader levels, muting and subgroups for mixing consoles (keyboard, live or recording). Available with or without VCAs (dbx). Plugs into patchbay or insert points. Optional graphics display card for Macintosh or Atari ST computers. Modular design and user transparent.

Basic Specifications & Suggested List Price: VCA control resolution 0.4 dB steps from 0 to -30 dB, 0.8 dB steps from -30 dB to -50 dB, 2.0 dB steps from -50 dB to -100 dB, typical MAGI VCA THD = 0.25% non-weighted, S/N -98 dB with no input, gain full on, non-weighted Attenuation better than 100 dB, typical 16-channel MAGI w/VCAs \$2,200

JL COOPER ELECTRONICS

1931 Pontius Ave.
Los Angeles, CA 90025
(213) 473-8771

Product Name: SAM (SMPTE Automation Manager)

Contact: A. Khan, sales manager

Date Product Introduced: November 1986, AES Los Angeles

Product Description & Applications: Specially designed storage/synchronization device for MAGI. RAM based, stores 11,000 automation moves. Reads/writes all formats of SMPTE, will automatically lock all automation memory to tape. Includes auto merge and auto update features. Optional disk storage unit, SAM Disk, can store 44,000 moves divided into four zones (Four complete mixes!) SAM Disk, via remote control automates saving, aborting, loading or protecting of passes. User transparent. Both units are rack mountable.

Basic Specifications & Suggested List Price: SAM automation timing resolution: +1/2 frame. SAM Disk is a 3.5" disk drive complete with remote. SAM \$849. Sam Disk \$995

DIGITAL CREATIONS CORP.

50 Werman Ct.
Plainview, NY 11803
(516) 822-0881

Product Name: Diskmix Moving Faders

Contact: Lee Pomerantz, sales manager

Date Product Introduced: October 16, 1987

Product Description & Applications: Diskmix Moving Faders is a powerful console automation system that can be installed into virtually any audio console. The new moving fader hard-

—CONTINUED ON NEXT PAGE

ware combines the power of multiple microprocessors with 10-bit conversion, the widely accepted Diskmix software and the latest motorized fader design from Penny & Giles to form a complete fader/mute automation system that is time code driven and able to store an unlimited number of mixes on hard or floppy disk
Basic Specifications & Suggested List Price: Please contact your Digital Creations dealer or the factory for system pricing.

EDITRON USA, INC.
 748 N. Seward St.
 Hollywood, CA 90038
 (213) 464-8723
 Product Name: Editron Model 100
 Contact: Morgan Martin, sales

Date Product Introduced: Summer-Fall 1987
Product Description & Applications: The Editron 100 is a synchronizer for both audio and video machines. Capable of handling one master and up to three slave machines via a number of standards including time code, pilot tone, quadrature and tachometer pulses, the versatility of this synchronizer will see it obtain applications in most areas of post-production. Other features include internal time code generator, jog capability, programmable relays and varispeed capabilities.
Basic Specifications & Suggested List Price: Up to three slave machines, lock stability +/-50 ms, wow & flutter degradation .01% worst case To achieve stable lock: one to two seconds for audio machines and U-matic, five seconds for film transports, six seconds for 1" video. Price \$10,000 to \$12,000



LAKE BUTLER SOUND CO., INC.
 MIDI Mitigator RFC-1, Remote MIDI System Foot Controller

LAKE BUTLER SOUND CO., INC.
 5331 W. Lk. Butler Rd.
 Windermere, FL 32786
 (305) 656-5515
 Product Name: MIDI Mitigator RFC-1, Remote MIDI System Foot Controller
 Contact: Emmett Bradford, pres.
Date Product Introduced: October 1, 1987
Product Description & Applications: The RFC-1 can store any MIDI command string possible, up to 255 bytes long, and transmit them in response to footswitches. The data is organized by song titles displayed on a large 16-character display. Each of 128 "songs" may have five command strings, allowing 640 strings! Other features include: continuous controller input, external computer control and backup, ordering of songs into three sets, 32-key membrane keyboard, eight footswitches, eight LEDs, rugged construction.
Basic Specifications & Suggested List Price: Dimensions: 24 5/8" W x 8 5/8" D x 2 5/8" H, 10-degree slant, power: 100-130 VAC, 50/60Hz, pedal input: 0-100k ohms, variable resistance, MIDI input: responds to program change, song-select, MIDI output: all MIDI commands, all channels. List price \$395.

LEIGHTRONIX, INC.
 2490 Cedar St., Ste. B
 Holt, MI 48842
 (517) 694-5589
 Product Name: TCD-TC
 Contact: Rick Todd
Date Product Introduced: January, 1987
Product Description & Applications: The TCD-CT and TCD-TC are universal event controllers which are geared for use in systems that do not have means for either switcher/GPI control, or need additional GPI control functions. The TCD-CT is used in control track-based systems, the TCD-TC in SMPTE time code systems. Uses include controlling tape transports, CD players, digital effects units, switchers, TBC freeze functions, character generators, still stores, etc.
Basic Specifications & Suggested List Price: Both units fea-

NEW PRODUCTS

AUTOMATION & CONTROL SYSTEMS

1988

ture: four source inputs, 250 battery-backed events, 16 GPI outputs, optional RS-232/422 outputs, "Quick Program" mode, random event entry, "plain English" prompts, variable output pulse width, error trapping, an easy-to-read fluorescent display, external enable input and much more. The TCD-CT is \$2,400, the TCD-TC is \$2,600.

MICROAUDIO, INC.
 4438 SW Hewett
 Portland, OR 97221
 (503) 292-8896
 Product Name: Model 28 Hand-held POD Programmer
 Contact: H.C. (Bud) Garrison, director of sales and marketing
Date Product Introduced: March, 1987
Product Description & Applications: Hand-held equalization POD programmer. Provides serial data entry to program MicroAudio's EQ PODs (patent pending).
Basic Specifications & Suggested List Price: Suggested list price: \$395. Hand-held serial data entry device which programs individual EQ bands on EQ PODs (patent pending).

MICROAUDIO, INC.
 4438 SW Hewett
 Portland, OR 97221
 (503) 292-8896
 Product Name: PC 280 Interface Card
 Contact: H.C. (Bud) Garrison, director of sales and marketing
Date Product Introduced: April, 1987
Product Description & Applications: IBM PC compatible card which allows interfacing of MicroAudio's equalizer PODs (patent pending) to the IBM PC and compatible computers. Allows operator to read RTA and EQ data from the Model 2800, store data on disk and provide hard copy for specification verification. Reads information from and sends information to as many as 16 EQ PODs simultaneously or individually. Multiple PODs can be addressed and EQ settings changed by programmable sequential time code.
Basic Specifications & Suggested List Price: Suggested list price: \$395. Full length card with gold-plated fingers. CMOS low power logic. Interface electronics will support cable lengths in excess of 100 feet. Software is compatible with MS DOS 2.0 and above, provided on 5.25" floppy disk. Host computers must have CGA 640 x 200 graphics capability.

MICROSYSTEMS INC.
 2500 E. Foothill Blvd., Ste. 102
 Pasadena, CA 91107
 (818) 577-1471
 Product Name: proMIX Automation
 Contact: Bob Billwalk
Date Product Introduced: July 1, 1987
Product Description & Applications: Simply patch proMIX in series with the audio path of your existing console and connect it to your MIDI sequencer. No computer is needed. Now do your mixdown using the proMIX panel in manual mode—just as you would use your existing board. Because proMIX is recording every subtle movement of faders and mutes, you are hearing your mix just as it will sound when you play it back in the auto mode. With proMIX, what you hear is what you get.
Basic Specifications & Suggested List Price: Edit mode allows changing fader moves using the proMIX auto splice system. ProMIX is expandable in any multiple of 8 channels. Prices start at \$1,995, a 32-channel version is \$3,995; and a 64-channel version is \$7,045.

MITSUBISHI PRO AUDIO GROUP
 225 Parkside Dr.
 San Fernando, CA 91340
 (818) 898-2341
 Product Name: XE-2 Digital Audio Editor
 Contact: Bill Windsor, senior marketing exec.
Date Product Introduced: January, 1987
Product Description & Applications: Offering the full spectrum of electronic editing capabilities, the XE-2 provides complete digital-to-digital editing between X-86 digital audio recorders (two source decks and one master), and dispenses with the need for cut-and-splice editing. The 11-second digital memory with search-shuttle function facilitates replay as well as accurate edit point location. After location, editing procedures are executed completely under electronic control, eliminating the need for cut-and-splice editing. Full editing information for both master and source decks (including edit points, time codes, current location and auto location points) is displayed and hard-copy printouts are possible to form an edit log.
Basic Specifications & Suggested List Price: \$29,900 list. PCM sound signal: 16-bit, complying with EBU standard (20-

bit reversed), memory duration: approximately 11s, memory resolution: 12 bits per word; crossfade time: selection of eight time bases, 2, 5, 10, 20, 40, 100, 250 and 500 ms.

NEOTEK CORPORATION
 1158 W. Belmont Ave.
 Chicago, IL 60657
 (312) 929-6699
 Product Name: MIDI Direct
 Contact: Susan L. Gosstrom, sales manager
Date Product Introduced: March, 1987
Product Description & Applications: MIDI Direct provides read, write and update of the mute functions on elite, elan and esprit consoles; this includes the mute group masters. The data for these commands is sent to the MIDI bus and is stored and replayed by any standard sequencer. The data rate is very low, so even the least expensive sequencer can store more than an album's worth of data in its random access memory. In brief, MIDI Direct makes your MIDI system think your NEOTEK console is a powerful musical instrument. Which, of course, is exactly what it is.
Basic Specifications & Suggested List Price: MIDI Direct can automate change in level, equalizations, effects sends and routing. There are non-musical applications as well, such as control of theatrical sound cues, which can be synched to a MIDI-based lighting controller. In addition, MIDI has now been extended to SMPTE, allowing direct interface of NEOTEK consoles to film and video editor systems. MIDI Direct is a NEOTEK exclusive, designed with Jim Cooper of J.L. Cooper Electronics.

OTARI CORPORATION
 2 Davis Dr.
 Belmont, CA 94002
 (415) 592-8311
 Product Name: Otari Tech TC-50 Time Code/FM Processor
 Contact: Tom Burrows, product specialist
Date Product Introduced: September, 1987
Product Description & Applications: The TC-50 is an inexpensive method for adding center track time code to an MX-5050 series Otari 2-track tape machine. It allows 1/4" 2-track machines to synchronize using SMPTE/EBU time code systems to a video or film machine providing stereo audio. Also the TC-50 can playback and decode stereo pilot-tone 1/4" tapes made on Nagra machines for resolving and transferring in the studio.
Basic Specifications & Suggested List Price: IEC format compatible time code record and playback. Stereo pilot-tone (FM style) decode circuit compatible with "Nagra sync" TM tapes. 19" rack mount single space cabinet, all inputs and outputs are balanced. Capable of all frame rates, code output is valid from +100% to -50% at 15 and 30 ips and from ±50% at 75 ips.

POLYPHONIC FX SYSTEMS
 3860 Hollypark Pl.
 Los Angeles, CA 90039
 (213) 661-9740
 Product Name: PFX "Optical Transfer Station"
 Contact: Tom Gunn, managing director
Date Product Introduced: NAB 1987
Product Description & Applications: PFX is a computerized editing system for sound samples. The system builds an event list similar to a videotape editing system yet it stores samples on a "write-once" optical laser disc. The system supports the Akai S-900 digital sampler and is used for sound effects and dialog editing for film, television and post-production applications.
Basic Specifications & Suggested List Price: The system is based on an Intel 80286 processor and supports various serial communication ports with a built-in synchronizer and wide-band time code reader. The system syncs events to picture with 2 frame lock-up time. Other features include pitch shift, variable time base, dynamic level control and polyphonic playback.

RICHMOND SOUND DESIGN LTD.
 1234 W. 6th Ave.
 Vancouver, B.C., V6H 1A5 Canada
 (604) 734-1217
 Product Name: Command/CUE™ 4096 Automation System
 Contact: Charles Richmond, president
Date Product Introduced: February, 1987
Product Description & Applications: Provides both immediate real time and memory control of volume levels, automatic timed fades up and down, plus two auxiliary analog switches in up to 4,096 separate audio channels and peripheral equipment. Specifically, up to 8,192 devices such as audio assignment switches, tape machines, CD players, slide projectors, lights, motors, video equipment and intelligent peripherals may be controlled by the auxiliary switches simultaneously with full range control of 4,096 faders.
Basic Specifications & Suggested List Price: Typically \$10,000 and up. Volume is controlled over a 90dB range in 60 1.5dB steps or 240 0.375dB steps plus fully muted. Signal to noise ratio is greater than 100 dB and worst-case distortion less than 0.5%. All analog switches and level changes are noiseless, glitch-free and directly controllable within microseconds by manual or programmed input instruction.



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Don Wooster, Vice President
Bill Bryan, Chief Engineer

Ron Rose Productions, Ltd.

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7393 S.W. 42 STREET
MIAMI, FL 33155

Circle #189 on Reader Service Card

NEW PRODUCTS

AUTOMATION & CONTROL SYSTEMS

1988

SHAPE SYSTEMS DESIGN, DIVISION OF SHAPE INC.
125 John Roberts Rd.
South Portland, ME 04106
(207) 879-0550

Product Name: Shape VHS Loading System
Contact: Neal Prescott, sales manager
Date Product Introduced: February, 1987
Product Description & Applications: The Shape VHS Loading System automates the loading of VHS cassettes from Xenon loaders, with simplicity, reliability and speed. For total floorplan and operation flexibility, the Shape VHS loading system consists of self-contained modules. High capacity cassette handling each two-loader module is capable of loading approximately six T-15 or four T-120 cassettes per minute. When six modules are connected in tandem, approximately 24 T-120 cassettes can be loaded per minute.

Basic Specifications & Suggested List Price: Dimensions: 57" W x 96" L x 56" H; weight: 1,000 pounds; shipping cube: 1,200 pounds; supply voltage: 220 VAC, 60 hertz 3 phase/240 VAC, 50 hertz; power consumption: 2,035 volt amps; supply air pressure: 100 psi; air consumption, including two Xenon winders: less than 7 CFM at 100 psi. Prices: Master Module \$22,500, add-on module \$21,500, Xenon Loader \$24,500. Please contact the above for pricing information on additional features/accessories.

SOUND & VISION
689 Benson Way
Thousand Oaks, CA 91360
(805) 496-1518

Product Name: Micro 1
Contact: Cornel Tanassy, owner
Date Product Introduced: July, 1987
Product Description & Applications: The Micro 1 is a micro-computer-controlled, hand-held tape controller for all reel-to-reel recorders. It allows the user to program three cue points which can then be used to perform auto punch in/out, loop, locate, rehearse and trigger. It will upgrade the performance of any machine from old Ampex AG-440s to new Sonys as well as all Otari, Fostex and Tascam models.

Basic Specifications & Suggested List Price: Tape counter and tracking system, three cue points, autolocate with ramp down routine (no swing, no overshoot), auto punch in/out (both rolling and rewind), rehearse mode with preroll, record loop mode with preroll, speed control, beep tone output, 4-way trigger out and complete remote controls. List \$399.



SOUNDMASTER INTERNATIONAL
Toronto, Ontario

SOUNDMASTER INTERNATIONAL INC.
306 Rexdale Blvd., Unit 5
Toronto, Ontario, M9W 1R6 Canada
(416) 741-4034

Product Name: Soundmaster Integrated Editing System
Contact: Bob Predovich, director
Date Product Introduced: Upgraded 1987
Product Description & Applications: The Soundmaster Integrated Editing System incorporates Syncro, the next generation machine synchronizer that is totally programmable. Controlled by the IBM PC-based Soundmaster software, proven in hundreds of TV and film productions, Syncro communicates at speeds of 5mHz. "Smart" machine-mounted interfaces allow for universal cabling. Modular construction facilitates rapid field expansion to 16 or more units. Each Syncro con-

tains an 8088 and 8087 microprocessor, and onboard RAM to support edit list multi-tasking. New features include Smart Sync™. Smart Sync™ is an exclusive patent-pending feature that allows machines to be synchronized while running off their standard speed.

Basic Specifications & Suggested List Price: Features include: variable speed lock up from up to 1/3 to three times play speed, numerous programmable closures for external device tripping, the designation of the master machine via the keyboard, and simultaneous synchronization of all international time codes. Complete with factory supplied cables and "smart" interfaces, suggested list price for three machine control is U.S. \$14,240 (FOB Toronto).

STUDIO MASTER SYSTEMS
PO Drawer P

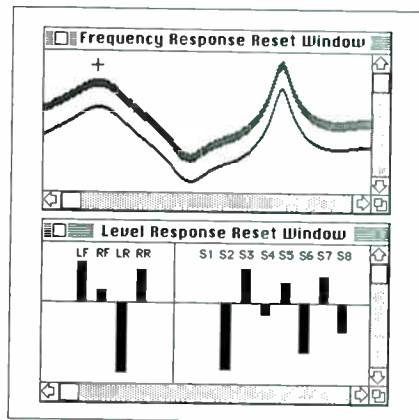
North Miami Beach, FL 33160
(305) 945-9774

Product Name: Studio Master Plus with CCL (Console Control Logging)

Contact: Seth Snyder

Date Product Introduced: Macintosh II Color Version October 1, 1987

Product Description & Applications: Studio Master Plus with CCL (Console Control Logging) is a software and hardware



STUDIO MASTER SYSTEMS
Studio Master Plus with CCL (Console Control Logging)

package for the Macintosh computer. With it you can scan and log all knob and fader positions on each mixing console module as well as reset all the knobs to their logged positions with extreme accuracy. The software includes an automatic billing system and a computerized track sheet, tape label system and a word processor.

Basic Specifications & Suggested List Price: Works with any mixing console—no modifications required. Will work with any size mixing console between 2- and 300-input channels. Accuracy of frequency response reset: +/- 1/4 dB; accuracy of level response reset: +/- 1/10 dB; number of measurements taken on each input channel: 1,016. List price \$12,500 U.S.

TASCAM/TEAC PROFESSIONAL DIV.
7733 Telegraph Rd.
Montebello, CA 90640
(213) 726-0303

Product Name: MIDI-IZER

Contact: Jon Bliese

Date Product Introduced: AES, Fall 1987

Product Description & Applications: The MIDI-IZER™ is a time-based hardware and software synchronizer designed for music and video production.

Basic Specifications & Suggested List Price: Approximate suggested retail price \$1,695

George
Harrison tells
all in the
November issue.

NEW PRODUCTS

COMPUTER HARDWARE AND SOFTWARE

1988

ADVANCED MUSIC SYSTEMS-CALREC

AMS Industries PLC, Billington Rd.
Burnley, Lancashire, BB11 5ES England
(0282) 57011

Product Name: Audiofile Software Updates
Contact: John Gluck, sales manager
Date Product Introduced: June, 1987

Product Description & Applications: 1) Digital backup interface for Sony 601/701 digital processor 2) Edit point location through full bandwidth "Reel Rocking" simulation 3) Simultaneous output from all eight channels. 4) Ability to cut and splice audio material more accurately and with greater flexibility than is possible with conventional tape techniques 5) Hardware update increasing number of disk drives to expand storage capacity. 6) New digital interface to Ampex and other manufacturers' video editing systems, allowing automatic coordination of video and audio editing.

Basic Specifications & Suggested List Price: Digital backup. £1,250, reel rocking, eight channels output, and cut and splice are all supplied with Audiofile. Audiofile with four hours of disk space: £56,950

AUDIOSOFT

PO Box 349
Heidelberg, 3084
Melbourne, Australia
61-3-493749

Product Name: CALSOD Computer Program
Contact: Witold Waldman, owner
Date Product Introduced: July, 1987

Product Description & Applications: CALSOD is a program for computer-aided loudspeaker system optimization and design. The designer uses graphical curve-fitting techniques to develop transfer function models of the sound pressure and impedance responses of loudspeaker drivers. CALSOD plots and numerically optimizes the summed acoustic output of individual drivers, driven through passive filter networks, which comprise a multi-way loudspeaker system. Sealed and vented box systems, as well as the effects of driver geometrical layout, can also be modeled.

Basic Specifications & Suggested List Price: Requires IBM or IBM compatible computer with twin floppies or one floppy plus one hard disk, color graphics adapter and 256K memory. An Epson compatible printer is recommended for obtaining screen dumps and listings of data files. List price \$850 U.S.

COMPUTER MUSIC SUPPLY INC.

382 N. Lemon
Walnut, CA 91789
(714) 594-5051

Product Name: CMS-VSS-AT
Contact: Kathleen, sales manager

Product Description & Applications: High performance visual sequencing system with 256 tracks. MIDI: two inputs, four outputs. A 12" amber or 14" color monitor. 20 megabyte of song storage. 1.2 meg floppy disk for backup-based on a 80286 cpu. Enclosed in a roadworthy 19" rack.

Basic Specifications & Suggested List Price: 80286 cpu running 10MHz-40ms 20 meg hard drive with self locking heads; 256 tracks; optional mouse and color monitor; full step editing, over 40,000 notes. Optional virtual disk system for songs limited only by disk space. List: \$2,495.

DATA CUBE INC.

4 Dearborn Rd.
Peabody, MA 01960
(617) 535-6644

Product Name: DSP 1000
Contact: Bruce Mackie, dir. of marketing
Date Product Introduced: July, 1987

Product Description & Applications: DSP 1000 is a turnkey digital signal processing development system. Equipped with modules from Datacube's MaxVideo family, DSP 1000 may be tuned to specialized applications. Audio signal processing applications may be written in the "C" programming language and executed on the DSP 1000.

Basic Specifications & Suggested List Price: Price dependent upon hardware configuration. May include any Datacube MaxVideo products. Baseline configuration has Digimax, Roistore, Euclid, VFIR-MKII and MaxMux. Host options include Sun workstation running Unix and 68020 CPU running OS9.

DIGIDESIGN

1360 Willow Rd., Ste. 101
Menlo Park, CA 94025
(415) 327-8811

Product Name: Sound Designer™ for the Roland S-10 and S-50, Casio FZ-1, Akai S612 and X7000
Contact: John Atcheson, dir. of sales and mktg
Date Product Introduced: August 15, 1987

Product Description & Applications: Digidesign's popular Sound Designer series of waveform editing/digital signal processing software adds a new version that works with several previously uncovered samplers. Unlike earlier versions of Sound Designer, which allow you to work with only one sampler at a time, this version allows you to transfer sounds between the multiple samplers it supports. It does not, however, include a front panel editing feature.

Basic Specifications & Suggested List Price: Version 1.12. Requires Macintosh with minimum 512K (plus external disk drive) and a MIDI interface. Suggested retail \$395.

DIGIDESIGN

1360 Willow Rd., Ste. 101
Menlo Park, CA 94025
(415) 327-8811

Product Name: Softsynth™ for the Atari ST
Contact: John Atcheson, dir. of sales and mktg
Date Product Introduced: July 1, 1987

Product Description & Applications: Digidesign's popular additive and FM synthesis program for the Macintosh finds its way to the Atari ST. All functions are identical to the Macintosh version, though the Atari ST version actually runs slightly faster.

Basic Specifications & Suggested List Price: Version 2.0. Requires Atari ST with minimum 512K. Suggested retail \$295.

DIGIDESIGN

1360 Willow Rd., Ste. 101
Menlo Park, CA 94025
(415) 327-8811

Product Name: Q-Sheet™
Contact: John Atcheson, dir. of sales and mktg
Date Product Introduced: August 15, 1987

Product Description & Applications: Q-Sheet is a comprehensive, SMPTE-based MIDI automation program for the Macintosh computer. Using MIDI-compatible equipment, Q-Sheet can simultaneously generate and mix down complete video soundtracks to a quarter-of-a-frame accuracy. In strictly audio situations, Q-Sheet automates every component of a mix-down, from the entire mixing console to specific parameters of each outboard device, all using precise SMPTE cues. Q-Sheet can even load a full music sequence as a single, SMPTE-synchronized event.

Basic Specifications & Suggested List Price: Version 1.0. Requires Macintosh with minimum 512K. SMPTE/MIDI time code converter and MIDI interface. Suggested retail \$495.

DIGIDESIGN

1360 Willow Rd., Ste. 101
Menlo Park, CA 94025
(415) 327-8811

Product Name: FX Designer™
Contact: John Atcheson, dir. of sales and mktg
Date Product Introduced: July 1, 1987

Product Description & Applications: FX Designer is a visual editor for the Lexicon PCM70 digital effects processor. Complex effects are represented by clean, easy to understand graphics, making editing of PCM70 parameters both faster and more intuitive. The program includes complete MIDI patching capabilities, making it easy to control every aspect of

PCM70 effects using external MIDI controllers. Banks of user-created effects can be saved to disk, or the program can be tied directly to the Opcode PCM70 librarian.

Basic Specifications & Suggested List Price: Version 1.0. Requires Macintosh with minimum 512K and MIDI interface. Suggested retail \$195.

DR. T'S MUSIC SOFTWARE

220 Boylston St., #306
Chestnut Hill, MA 02167
(617) 244-6954

Product Name: Model "S"
Contact: Bruce Carroll, director product support
Date Product Introduced: August, 1987

Product Description & Applications: Hardware Tape Sync Box with SMPTE-like code with song pointer! One MIDI In (acts as merge), two MIDI Outs. 1/4" tape in and out. Also able to read and write SMPTE with MIDI time code. \$199.

Basic Specifications & Suggested List Price: \$199

DR. T'S MUSIC SOFTWARE

220 Boylston St., #306
Chestnut Hill, MA 02167
(617) 244-6954

Product Name: Keyboard Controlled Sequencer for Atari ST
Contact: Bruce Carroll, director product support
Date Product Introduced: November, 1986

Product Description & Applications: Three modes of operation. Track mode: 48-track automated sequencer. Ability to record continuous overdubs without your hands leaving your synth! Mouse-operated control panel with all the usual tape recorder features, plus much more! Full editing of any parameter! Open mode: 126 independent sequences of unlimited tracks! Ability to have one or more sequences "control" other sequences; song mode: simple method of tying together sequence to form songs.

Basic Specifications & Suggested List Price: \$225 retail. Track mode: 48 tracks, full editing, "live editing," "record mute," "quantize in real time if desired," open mode: 126 sequences, full editing, control sequences; song mode: up to 16 songs. 113,000+ notes on 1040 ST. Full song pointer implementation.

DRUMWARE, INC.

12077 Wilshire Blvd., #515
Los Angeles, CA 90025
(213) 478-3956

Product Name: Soundfiler ST
Date Product Introduced: July, 1987

Product Description & Applications: Soundfiler ST is visual sample editing software for Atari ST computers. Sounds can be transferred via MIDI to the computer for editing and storage on standard 3.5" disks. The system is comprised of visual editing aids including a looping editor, waveform drawing, cut and paste style editing and front panel programming. The digital signal processing elements include crossfade looping, digital EQ and digital enveloping. This easy-to-use GEM-based program is completely mouse-driven.

Basic Specifications & Suggested List Price: The first packages in the Soundfiler Series support the Akai S612, X7000/S700 and S900. There is a generic version available for instruments using the MIDI Sample Dump Standard. Soundfiler ST runs on 1040 color/mono (list \$299). The Akai S612 and X7000/S700 versions also run on the 520ST (list \$199).

DUKANE CORPORATION

2900 Dukane Dr.
St. Charles, IL 60174
(312) 584-2300

Product Name: MagniView 200-Computer Projection Panel
Contact: Brian Warner, industrial product manager
Date Product Introduced: September, 1987

Product Description & Applications: High contrast LCD panel allowing clean, sharp projection of real time PC graphics and text. Lightweight panel is capable of interfacing with any IBM (and compatible) or Apple II family computer with RGB or composite video output. MagniView 200 rests on top of a transmissive overhead projector and functions as an electronic transparency, allowing monitor data to be projected onto any large screen.

Basic Specifications & Suggested List Price: Features super-twist, high contrast LCD with 8.3" x 6.2" active area, 4:3 aspect ratio, heat tolerant LCD and built-in high efficiency fan, "Chip-On-Glass" technology (circuitry embedded in LCD panel), 640 line x 200 column resolution, six top mounted, onboard panel controls. Suggested list \$1,195.

HARMONY SYSTEMS, INC.

3672 Howell Wood Trail
Duluth, GA 30136
(404) 662-8788

Product Name: SynHance MTS-1 MIDI Chase Lock
Contact: Douglas R. Kraul, president
Date Product Introduced: February, 1987

—CONTINUED ON NEXT PAGE

Product Description & Applications: The SynHance MTS-1 is a complete tape synchronization system that allows accurate syncing of a tape recorder to a MIDI sequencer. Once connected to the MTS-1, the sequencer will chase-lock to the tape, regardless of where the tape is started. A fault-tolerant recording method is used which allows accurate synchronizing even in the most demanding application. Special error recovery circuitry recovers sync even during drop-outs. Complete, including two built-in mergers for live overdubbing while syncing.

Basic Specifications & Suggested List Price: Two MIDI inputs, three MIDI outputs. To tape, from tape. Supports full MIDI Song Pointer, MIDI input while syncing, and keyboard echo. One-half single space rack unit for table top or rack mounting. 12VDC power supply included. Suggested retail \$229.

HYBRID ARTS INC.
11920 W. Olympic Blvd.
Los Angeles, CA 90064
(213) 826-3777

Product Name: SMPTE-Track
Contact: Frank Foster, vice-president
Date Product Introduced: January, 1987

NEW PRODUCTS

COMPUTER HARDWARE
AND SOFTWARE

1988

Product Description & Applications: A 60-track polyphonic MIDI recording system with full event editing capability. SMPTE is bit accurate and reads and writes all standard versions of SMPTE including user bits. (This includes 30 non-drop, drop, 25 and 24 frames.) Reads and writes FSK and 96-, 48- and 24-clock square waves. Expandable to four MIDI streams.

Basic Specifications & Suggested List Price: Package includes SMPTE hardware and sequencing software. Runs on the Atari ST (520ST, 1040ST or MEGAST) monochrome or RGB. Suggested list price \$575.95.

HYBRID ARTS INC.
11920 W. Olympic Blvd.
Los Angeles, CA 90064

(213) 826-3777

Product Name: ADAP Sound Rack
Contact: Frank Foster, vice-president
Date Product Introduced: June, 1987

Product Description & Applications: 16 bit stereo sampling and graphic editing workstation. Adjustable sampling rate (5kHz-44.1kHz). Storage of up to 64 multi-samples in memory for instant playback. Real time digital effects. Supports MIDI digital dump standard. Real time oscilloscope and fast Fourier spectral analysis screen. Directly reads disk file formats of most of the major samplers.

Basic Specifications & Suggested List Price: Works with the Atari ST with at least one meg of RAM, monochrome or color.



LEONARDO SOFTWARE
Professional Librarian™

LEONARDO SOFTWARE

693 Washington St.
Venice, CA 90292
(213) 305-1521

Product Name: Professional Librarian™
Contact: Dale Strumpehl
Date Product Introduced: October, 1987

Product Description & Applications: Professional Librarian™ is a MS-DOS software package and interface for the Sony CDK-006 60-disc compact disc player. The system provides computer controlled search and playback of sound effects and production music libraries. Users can define searches by category, description, tempo, length, instrumentation, sound-a-like, key or mode. A list of selections is stored as a sequence, which can be triggered by contact-closure or voltage-change control systems via the custom interface.

Basic Specifications & Suggested List Price: The software prints a report detailing library usage for royalty and client billing purposes. Also available are software programs to facilitate sound effects editing, to print mixing cue sheets and to organize dialog replacement paperwork.

MICRO TECHNOLOGY UNLIMITED

2806 Hillsborough St.
PO Box 12106
Raleigh, NC 27605
(919) 833-1458

Product Name: Digisound-16 PC/AT Interface
Contact: David B. Cox, president
Date Product Introduced: April, 1987

Product Description & Applications: This interface provides all hardware and software to attach the MTU Digisound-16 16-bit A/D-D/A converter system to PC and AT bus computers. The standard software operates to/from memory with optional sustain to/from disk for large sound files. With Digisound-16, this interface provides full 16-bit digitizing and recreating of audio sounds at rates up to 48k samples/second stereo. By storing to disk, optional software can be used to synthesize, analyze or change the sound. Mixing of multiple channels is also available.

Basic Specifications & Suggested List Price: Interface for PC XT/AT bus computers, \$800. Sustained to/from disk drivers for 8086/80286 processor, \$400. Digisound-16 16-bit, 50KS/s max stereo, A/D and D/A, parallel interface providing programmed I/O or DMA transfers, \$2,995. Filter modules (select 45k, 44k, 25k, 20k, 10k or custom), \$200 each.

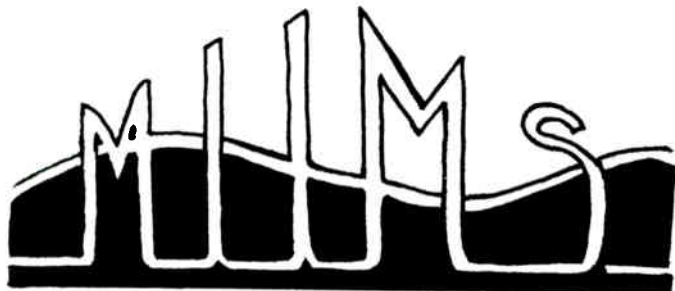
MICRO TECHNOLOGY UNLIMITED

2806 Hillsborough St.
PO Box 12106
Raleigh, NC 27605
(919) 833-1458

Product Name: Digisound-16 DEC/SUN Interface
Contact: David B. Cox, president
Date Product Introduced: August, 1987

Product Description & Applications: This interface provides the hardware link to attach the MTU Digisound-16 16-bit

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Canada H3A 1E3 (514) 398-4548

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A/D-D/A converter system to DEC Q-bus and unibus computers, and to SUN microsystems system 3 VME-bus-based systems thru DR11-W type interface cards. Software drivers exist for the VMS operating system and Unix (Berkeley 4.2) are under development. With Digsound-16, this interface provides full 16-bit digitizing and recreating of audio sounds at rates up to 48k samples/second stereo. Samples are placed directly into the computer memory with optional storage to disk for larger sound files. Optional software can be used to synthesize, analyze or change the sound.

Basic Specifications & Suggested List Price: Interface for DR11-W type cards (available for DEC and SUN), \$1,000. Digsound-16 16-bit, 50KS/S max stereo, A/D and D/A, parallel interface providing programmed IO or DMA transfers, \$2,995. Filter modules (select 48k, 44k, 25k, 20k, 10k or custom), \$200 each.

OVAL WINDOW AUDIO

4 Collins Rd.
Yarmouth, ME 04096
(207) 846-6250
Product Name: Sound and Speech Visualizer
Contact: Norman Lederman, director
Date Product Introduced: January, 1987
Product Description & Applications: The Sound and Speech Visualizer is a real time spectrum analyzer that graphically displays the frequency components of sound on any black and white or color television. Consisting of a dedicated computer, built-in software, audio mixer and two microphones, the visualizer's applications range from educational (teaching physics of sound) to speech therapy, to colorful music displays.

Basic Specifications & Suggested List Price: Selectable single trace 1- or 1/2-octave display (31.5Hz - 12.5kHz), fast or slow response, freeze display, peak hold, easy hookup to any television (color is recommended). Suggested list price \$695.

RASICCI MUSIC SERVICES

118 E. Kingwood, Ste. E-12
Murfreesboro, TN 37130
(615) 890-2042
Product Name: DX7 Patches
Contact: Michael V. Rasicci, president
Date Product Introduced: December, 1986
Product Description & Applications: We specialize in programming custom sounds for the DX7. All we request is a complete description of the desired sound or a cassette tape recording of the sound. We also have a set of patches available for sale as an example of our programming skills. We also carry DW-6000 patches.

Basic Specifications & Suggested List Price: Each custom patch ordered is \$10. Our sample of 48 patches is \$25.

SHINTRON COMPANY, INC.

144 Rogers St.
Cambridge, MA 02142
(617) 491-8700
Product Name: CB100-LC Candybox Level Converter
Contact: Fran Curran, sales
Date Product Introduced: June, 1987
Product Description & Applications: IBM-PC to RS170 Level Converter allows you to feed your IBM-PC output to a video monitor, RGB projector or some VCRs. Allows you to record or route or display IBM color graphics from CGA, EGA, or monochrome cards. Signal can be routed via routing switcher. Self-contained unit. Can be rack mounted. Can be user-configured to produce sync on any channel. Position-adjustable back porch clamping.

Basic Specifications & Suggested List Price: Input 9-pin D connector loop-thru, 10k ohm impedance, output BNC connectors, 75 ohm impedance, dimensions 5.25"W x 1.7"H x 10"D, power 115V-230V, 50-60Hz, 20W.

SOUND GENESIS CORPORATION

7808 CreekrIDGE Center
Minneapolis, MN 55435
(612) 944-8528
Product Name: Master Sampler Collection™
Date Product Introduced: August, 1987
Product Description & Applications: The Master Sampler Collection™ is designed for the Fairlight™ CMI Series II/III and contains over 20 separate packages of documents, software and media, each of which includes ten "virtual instruments" from one of three categories—instrumental, vocal or environmental. Also, a proprietary program now being developed is designed to connect an Apple Macintosh to a Fairlight computer, for quick, easy visual access to Sound Genesis' data base of virtual instruments and signal processing functions.

SONUS CORPORATION

21430 Strathern St., Ste. H
Canoga Park, CA 91304
(818) 702-0992
Product Name: MasterPiece
Contact: Sonus sales representative at (818) 702-0992
Date Product Introduced: June, 1987

Product Description & Applications: MasterPiece is a professional sequencing program for the Atari 520/1040 ST which supports dual MIDI port capabilities providing 32 possible MIDI channels. The MasterPiece includes elaborate event editing and can be used in sequence or song mode. With 32 tracks per sequence to work with, the artist has an abundance of recording room. MasterPiece is a full-featured state-of-the-art sequencer/compositional MIDI software program designed for musicians who demand excellence.

Basic Specifications & Suggested List Price: Specifiable exit data, drum channel transpose protect, input filter selects, MIDI viewer, captive play thru/multiple channel capability, track bounce/unbounce, sequence bounce, seam manager, controller mapping, auto punch/live punch, song auto muting (programmable), programmable cue points, event editing, quantization-auto correct and song pointer. List price: \$475.

SONUS CORPORATION

21430 Strathern St., Ste. H
Canoga Park, CA 91304
(818) 702-0992
Product Name: MacFace MIDI Interface
Contact: Sonus sales representative at (818) 702-0992
Date Product Introduced: April, 1987
Product Description & Applications: The Sonus MacFace has two ins and six outs/thrus. The MacFace comes with a power supply allowing it to serve as a stand alone thru box, even when your Mac is off! This superior interface incorporates printer and modem thrus, which allows you to leave both your modem and printer on line. The MacFace also has both MIDI In and Out data indicators. The MacFace attaches to your Mac's modem and printer ports.

Basic Specifications & Suggested List Price: Two ins/six outs, four data in/out indicators, power supply included, special MIDI thru switch (allows MacFace to serve as thru box), special printer/modem thru switches (allows you to leave modem and printer on line), works with all Macintosh computers (with appropriate adapter cables). List price \$239.95.

STEINBERG SOFTWARE

C/O RUSS JONES MARKETING GROUP
17700 Raymer St., Ste. #1001
Northridge, CA 91325
(818) 993-4091
Product Name: PRO-24 2.1
Contact: Geoff Ryle, products specialist
Date Product Introduced: June, 1987
Product Description & Applications: PRO-24 2.1 is a 24-track sequencer software program for the Atari ST which offers more features than any other available program for any computer. The program provides both tape-mode linear sequencing and song-mode pattern-arrange sequencing styles concurrently and stores up to 200,000 events (5,000 patterns). MIDI data may be edited by either using the "score-edit" notation window, or the "grid-edit" window. "Over-quantize" works with the musician, accenting his/her individual playing style. PRO-24 2.0 was nominated for a 1987 TEC Award.

Basic Specifications & Suggested List Price: Retail \$349.24 tracks, 200,000 events, real time editing, advance/delay tracks, built-in sys/ex dump-utility, three modes of cycle-record, global transpose, time signature and real time tempo changes, overquantize, reverse, double-time/half-time, individual looping of tracks, mixdown or unmix tracks, ten programmable autolocators and muting configurations.

VOYETRA TECHNOLOGIES

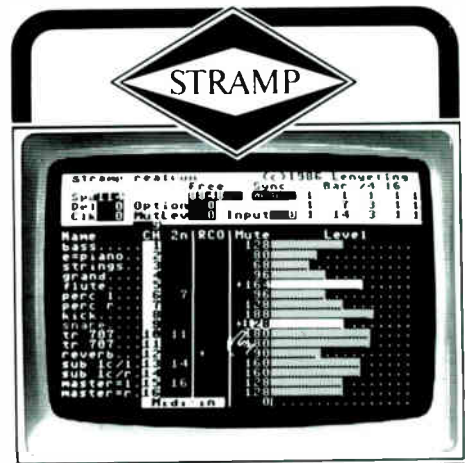
426 Mt. Pleasant Ave.
Mamaroneck, NY 10543
(914) 698-3377
Product Name: Patch Master Plus
Contact: Fred Romano, VP
Date Product Introduced: June, 1987
Product Description & Applications: Universal Librarian program with MIDI terminal. Allows the IBM PC/AT to store and download programs to MIDI instruments. Also allows viewing of MIDI data on the screen for analyzing MIDI network activity.

Basic Specifications & Suggested List Price: Patch Master Plus/Universal Librarian, MIDI network organizer, MIDI data analyzer program for IBM PC/AT. Suggested list \$195.

VOYETRA TECHNOLOGIES

426 Mt. Pleasant Ave.
Mamaroneck, NY 10543
(914) 698-3377
Product Name: Sequencer Plus Series
Contact: Fred Romano, VP
Date Product Introduced: February, 1987
Product Description & Applications: Sequencer programs for IBM PC/AT computers. Allow recording, editing and arranging of MIDI information on the computer. Three levels of programs are available. Sequencer plus Mark III allows 64 tracks of data to be recorded, sequencer plus Mark II allows 32 tracks and sequencer plus Mark I 16 tracks. The programs also have more esoteric features as their "mark" number goes up.

Basic Specifications & Suggested List Price: Sequencer Plus MK III, 64-track MIDI sequencer \$495. Sequencer Plus MK II 32-track MIDI sequencer \$295. Sequencer Plus MK I 16-track MIDI sequencer \$99.



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MICROPHONES AND PICKUPS

1988



AKG ACOUSTICS, INC.
AKG C-522 ENG Stereo Microphone

AKG ACOUSTICS, INC.

77 Selleck St.
Stamford, CT 06902
(203) 348-2121
Product Name: AKG C-522 ENG Stereo Microphone
Contact: Dave Talbot, national sales manager
Date Product Introduced: April, 1987
Product Description & Applications: The C-522 ENG is a unique stereo microphone designed primarily for hand-held use by field reporters. Acoustically tuned to transmit the voice clearly, the C-522's wide frequency range also makes it suitable for music recordings, where its stereo perspective will deliver an excellent reproduction of the sound stage.

Basic Specifications & Suggested List Price: The C-522 ENG contains two cardioid condenser capsules with 90-degree opening angle, in a close proximity X/Y configuration. Fitted with a built-in rechargeable battery and an integrated on/off switch in the cable connector, the C-522 may be connected to all balanced or unbalanced recording equipment with or without phantom power. Pro user net price is \$950.

ASTATIC

Harbor & Jackson Sts.
Corneaut, OH 44030
(216) 593-1111
Product Name: 880VL Microphone
Contact: Adolph W. Santorine Jr., national sales mgr
Date Product Introduced: July, 1987
Product Description & Applications: Variable length, shock-mounted, miniature gooseneck condenser microphone. Applications include podium, pulpit and teleconferencing. The gooseneck on this microphone adjusts from 2" to 17" and locks into the desired length.
Basic Specifications & Suggested List Price: 50 to 20k Hz frequency response, cardioid pickup pattern, phantom power from 9 to 52 volts

AUDIO-TECHNICA U.S., INC.

1221 Commerce Dr.
Stow, OH 44224
(216) 686-2600
Product Name: AT4073
Contact: Greg Silsby, marketing manager, professional products
Date Product Introduced: October, 1987
Product Description & Applications: The AT4073 is a DC bias, transformerless studio condenser microphone. The very directional AT4073 employs a unique design that maintains tight low frequency directionality using a short interference tube that is just half the length required of normal short "shot-

gun" microphone designs. Its narrow acceptance angle, uniform polar response, very high output, low noise and light weight make the AT4073 well suited to the needs of ENG, EFP, video and film production.

Basic Specifications & Suggested List Price: Frequency response: 30-20,000Hz; sensitivity: -27 dB (0 dB = 1 mW/PA); equivalent input noise (EIN): 14 dB; output impedance: 250 ohms; phantom power: 12-48 VDC (2.9 mA); switch: low-cut filter; length: 9 1/2"; weight: 4.2 ounces; professional net price: \$595.

AUDIO-TECHNICA U.S., INC.

1221 Commerce Dr.
Stow, OH 44224
(216) 686-2600
Product Name: AT4071
Contact: Greg Silsby, marketing manager, professional products
Date Product Introduced: October, 1987

Product Description & Applications: The AT4071 is a DC bias, transformerless studio condenser microphone. The highly directional AT4071 employs a unique design that maintains tight low frequency directionality using an interference tube half the length required of normal "shotgun" microphone designs. Its narrow acceptance angle, uniform polar response, very high output, low noise and light weight make the AT4071 well suited to a variety of applications in film, video, ENG, EFP and theater.

Basic Specifications & Suggested List Price: Frequency response: 30-20,000Hz; sensitivity: -25 dB (0 dB = 1 mW/PA); equivalent input noise (EIN): 12 dB; output impedance: 250 ohms; phantom power: 12-48 VDC (2.9 mA); switch: low-cut filter; length: 15-17 1/2"; weight: 5.8 ounces; professional net price: \$710.

AUDIX CORPORATION

110 Ryan Industrial Ct.
San Ramon, CA 94583
(415) 831-0808
Product Name: OM-2
Contact: Cliff Castle, VP sales
Date Product Introduced: January, 1987

Product Description & Applications: The OM-2 is an ergonomically designed high performance vocal/instrument mic for live performance and recording applications. By combining a moving coil with a new "VLM" capsule technology, the OM2 offers a frequency response 40-20,000 Hz along with the capability of handling concert sound pressure levels of over 140 dB without distortion or coloration. The OM2 has extremely low sensitivity to handling noise and a very tight hypercardioid pick pattern which results in exceptional off-axis rejection of over 30 dB.

Basic Specifications & Suggested List Price: Operating principle: pressure gradient; frequency response: 40-20,000 Hz; output impedance: 200 ohms (stepped up from 40 ohms); sensitivity: -78.5 dB (0 dB = 1V/microbar); housing: die cast zinc alloy, grille screen: woven steel mesh with integral pop filter; finish: black chrome, gun metal, brushed satin. List price \$189.

AUDIX CORPORATION

110 Ryan Industrial Ct.
San Ramon, CA 94583
(415) 831-0808
Product Name: UD300
Contact: Cliff Castle, VP sales
Date Product Introduced: January, 1987
Product Description & Applications: Vocal/instrument dynamic microphone designed to meet the rugged demands of pro sound. A new "VLM" capsule effectively eliminates handling noise and boominess. A light cardioid pattern allows for greater separation of sound and higher gain before feedback. The 300 provides crisp clean vocal clarity and withstands concert sound pressure levels of over 130 dB. Also available with on-off switch (models UD360).

Basic Specifications & Suggested List Price: Operating principle: pressure gradient; freq. response: 50-18,000 Hz; impedance: 200 ohms; sensitivity: -73 dB (0 dB = 1V/microbar); front to back ratio: > 20 dB at 180, 1kHz; housing: die cast zinc; grille screen: woven steel mesh with integral pop filter; finish: gun metal. List price \$159.

BEYER DYNAMIC INC.

5-05 Burns Ave.
Hicksville, NY 11801
(516) 935-8000
Product Name: MPC 40, MCE 10, MCE 81, M 58, DT 770, DT 990

Contact: Mike Solomon, marketing manager
Date Product Introduced: Summer, 1987
Product Description & Applications: MPC 40 low profile condenser microphone for unobtrusive acoustical boundary applications for recording and sound reinforcement, MCE 10 miniature hypercardioid condenser microphone for musical instruments, lavalier and theater sound applications, MCE 81 super cardioid condenser microphone with excellent gain-before-feedback for instrument and close-up vocal assignments either in-studio or on-stage. M 58 shock-mounted dynamic microphone for broadcast news and sports interviews. DT 770 (sealed) and DT 990 (semi-open) headphones for critical music monitoring in recording studios and broadcast radio facilities.

CETEC VEGA

9900 Baldwin Pl.
El Monte, CA 91731
(818) 442-0782

Product Name: Model R-32 Pro 2 Diversity Wireless-Microphone Receiver
Contact: Kenneth M. Bourne, director of marketing
Date Product Introduced: October 1, 1987

Product Description & Applications: Cetec Vega's Model R-32 Pro 2 Diversity Wireless-Microphone Receiver is compatible with all "Pro" and "Pro Plus" transmitters with Dynex® II audio processing. General appearance and specifications are similar to the popular R-31A Pro 1 receiver, with the added benefit of true diversity to prevent "multi-path" signal dropouts ("hits"). Front-panel bargraph displays show audio level and selected RF signal level. The GaAs FET front end provides high sensitivity and wide RF dynamic range. The preselector is a true two-pole helical-resonator filter.

Basic Specifications & Suggested List Price: Sensitivity 2.2 μV (typical) for 50 dB S/N, ultimate quieting 105 dB (A-weighted), harmonic distortion 0.2% typical, audio output typically +14 dBm on highest setting before clipping, power 105-130 or 210-260 Vac, 50 or 60Hz, 10 W maximum consumption, may be powered from external +15 to +24 Vdc (0.4 A maximum), dimensions 1.75"H x 8.45"W x 9.75"D, price to be announced.

CETEC VEGA

9900 Baldwin Pl.
El Monte, CA 91731
(818) 442-0782

Product Name: Model R-33 Pro Plus Portable Wireless-Microphone Receiver
Contact: Kenneth M. Bourne, director of marketing

Date Product Introduced: March, 1987
Product Description & Applications: Cetec Vega's Model R-33 Pro Plus Portable Wireless-Microphone Receiver is small enough to mount on a camera, in a shirt pocket, or on a belt. It provides studio-quality audio for a headset, recorder, or sound system. It runs at least eight hours on a 9-volt battery, if the RF/AF/battery display is turned off. With Dynex® II audio processing, sound quality is smooth and clean. A GaAs FET preamplifier provides high sensitivity and excellent intermodulation performance. A true helical resonator and ten poles of IF filtering provide high selectivity.

Basic Specifications & Suggested List Price: System S/N 104 dB, typical, A-weighted, system dynamic range 104 dB, typical, A-weighted, audio output (adjustable), line level +10 to -20 dBm (at full deviation), +14 dBm minimum at clipping, mic level -15 to -45 dBm at full deviation (about -30 to -60 dBm with normal headroom), power: internal 9-volt alkaline battery (8-10 hours operation), or external +10 to +20 VDC, 35-45 mA, dimensions: 3.3 x 0.8 x 5.5; suggested list price \$1,199.

HM ELECTRONICS, INC.

6675 Mesa Ridge Rd.
San Diego, CA 92121
(619) 535-6060

Product Name: 50 Series Wireless Microphones
Contact: Tonnia B. Silis, marketing coordinator
Date Product Introduced: July 15, 1987
Product Description & Applications: The 50 Series was designed expressly for the church, theater and professional entertainment markets. It consists of the System 50 Dual-Frequency Body-Pac and System 55 Wireless Hand-held. Both systems incorporate HME's new NRX-III™ noise reduction system which provides crisp, clear audio that is noticeably superior to any noise reduction system used with other wireless microphones. Features include: mic-mute and power

switch lock outs, operator selectable RF frequency selection on body-pac, hand-held comes with choice of four different elements. Six systems can operate simultaneously with no crosstalk or interference.

Basic Specifications & Suggested List Price: The System 50 consists of the RX520 Receiver and the TX550 Body-Pac Transmitter. Transmitter features include: dual frequency selection, mic-mute switch, mic gain adjust, low-battery LED indicator, reversible belt clip. The System 55 consists of the RX520 Receiver and the TX555 Hand-held Transmitter. Transmitter features include: choice of four different microphone elements, automatic lock for power on/off switch, mic-mute switch with lockout, low-battery LED indicator, integral antenna, NRX-11™ noise reduction.

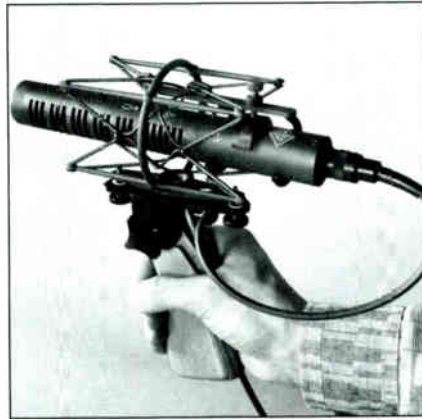
J.T. ENTERPRISES
6924 W. Arrowhead
Kennewick, WA 99336
(509) 735-7430

Product Name: "Acous-Tech™" Film Pickup
Contact: Steve Hickman, pres.

Date Product Introduced: October 30, 1986

Product Description & Applications: Thin film pickup, approx 40 microns thick, can be used direct into amp, recording board, or PA board on any acoustic instrument, guitar, piano, drums, congas, violins, cello, tympani. Isolates the instrument for independent equalization and gain before feedback, will not restrict vibration of the instrument. Comes with preamp w/volume, bass, treble, controls, mounts with double-sided transfer tape, won't mar finish.

Basic Specifications & Suggested List Price: Shielded cable, quality Switchcraft ends, frequency response 1Hz-mega Hz flat across audio range (pickup) preamp specs subject to change, call for specs, suggested retail, pickup and preamp under \$100



GEORG NEUMANN GMBH
RSM 190 Microphone

GEORG NEUMANN GMBH, BERLIN WEST GERMANY
c/o Gotham Audio Corporation
1790 Broadway
New York, NY 10019
(212) 765-3470

Product Name: RSM 190 Microphone
Contact: Jerry Graham, sales manager
Date Product Introduced: June, 1987
Product Description & Applications: Stereo shotgun microphone for film, television and ENG applications. Combines forward facing short shotgun microphone with side facing figure 8 for coincident stereo pickup. Combination allows "reach" of a shotgun microphone with variable stereo imaging. Integral matrix box switches between XY or MS format and includes a side signal level control. Microphone is lightweight and ruggedly constructed for on-location use. Matrix attaches to ball.

Basic Specifications & Suggested List Price: (M) pressure gradient interface transducer; (S) pressure gradient transducer. Frequency range 40Hz-18kHz; sensitivity at 1kHz 23 mV/Pa; s/n ratio 1 Pa DIN 45590 (M/S) 69/63 dB, A-weighted equivalent loudness level due to inherent noise DIN IEC 651 16/22 dB, max. SPL at 1kHz for 0.5% THD, 134 dB, power supply 2x48V±.4V current consumption 2x1.9mA

PANASONIC RAMSA
6550 Katella Ave.
Cypress, CA 90630
(714) 895-7277

Product Name: Miniature Condenser Cardioid Microphone
Series Models WM-S1, WM-S2, WM-S5, WMS10
Contact: Steve Woolley, sales & mkt mgr
Date Product Introduced: January 15, 1987

Product Description & Applications: Four electret condenser miniature microphones each designed for a unique set of applications from cymbals and strings to woodwinds and brass. All have exceptionally smooth cardioid patterns, excellent transient response and smooth, accurate sound quality. The WM-S1 and WM-S5 are phantom only (very high SPL). The WM-S2 and WM-S10 are phantom or battery (moderately high SPL). Each includes a flexible "applications kit" mounting system. The WM-S10 is headset-mounted for instrumentalists who are also full-time vocalists.

Basic Specifications & Suggested List Price: WM-S1: 50Hz-18kHz, 148 dB SPL, 48V phantom; WM-S2: 120Hz-15kHz, 138 dB SPL, 48V phantom or battery; WM-S5: 70Hz-16kHz, 158 dB SPL, 48V phantom; WM-S10: 120Hz-15kHz, 138 dB SPL, 48V phantom or battery. Suggested list: WM-S1 \$199, WM-S2 \$149, WM-S5 \$269, WM-S10 \$199

PANASONIC RAMSA
6550 Katella Ave.
Cypress, CA 90630
(714) 895-7277

Product Name: Model WS-A240 Subwoofer, Model WS-SP2 Processor

Contact: Steve Woolley, sales & mkt mgr
Date Product Introduced: January 15, 1987
Product Description & Applications: WS-A240 Subwoofer with WS-SP2 Subwoofer Processor designed to supplement the lower octave of frequency range with Ramsa WS-A10, WS-A80 and WS-A200 loudspeaker systems (or non-Ramsa loudspeaker systems). A high-power dedicated 12" subwoofer driver in a tough, compact molded resin enclosure with a rack mount subwoofer crossover/processor. Typical applications include professional playback systems (disco, VJ, cinema, etc.), PA systems and instrument amplifier systems.

Basic Specifications & Suggested List Price: Power capacity: 400 watts (WS-A240 with WS-SP2); sensitivity: 91 dB /watt/1 meter dimensions: WS-A240 is 16" x 22" x 10.75" (approx.), WS-SP2 is 19" rack mount, 1 rack height; weight: WS-A240 is 35 lbs., WS-SP2 is 6 lbs, suggested retail: WS-A240 \$349, WS-SP2 \$175.

I Laughed



... when the salesman showed me the **NEW TOA microphones**. "These would look great in a science-fiction movie set", I laughed. "The windscreens look like ray guns. My customers are serious professionals, they will not take these seriously".

He said, "Our mics are a better value, and the other brands don't include a windscreen and cable. So what if the hard plastic windscreen is ugly, it works good. So think of it as **FREE!**"

Well, I know **TOA** equipment sounds great and is extremely reliable, so I decided to give these mics a try. And guess what? You should too! Not only are they a great value, but... **I WILL GUARANTEE YOUR SATISFACTION ON TOA'S 8 UNIQUE MODELS.** Call us for details.

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Circle #193 on Reader Service Card

Milab

MICROPHONE LABORATORIES

MILAB
LC-28

MILAB
11288 Ventura Blvd., Ste. 304
Studio City, CA 91604
(818) 843-1830 IMC2140

Product Name: LC-28

Contact: Colin Waters

Date Product Introduced: October, 1987

Product Description & Applications: Milab's LC-28 is a new version of their respected LC-25 transformerless condenser microphone. It includes switchable high pass filter, with 10 and 20 dB pads. Switches are recessed and screwdriver operated. Sensitivity is increased by 5 dB for the most delicate studio work while the maximum SPL is 145 dB for the loudest "live" transients. Advanced transformerless technology combined with a rugged hand-held design, makes this one of the most flexible, high-quality microphones now available.

Basic Specifications & Suggested List Price: Clean, clear, transformerless sound. Excellent directivity. Highly resistant to handling noise and moisture. Frequency response 40-20,000Hz. Cardioid. Power supply 48V ±.4V phantom. Current consumption 3.5mA. A-weighted noise level (acc. to IEC 179-A) 20 dB. Output impedance 170 ohms. Minimum load impedance 1k ohm

NADY SYSTEMS, INC.
1145 65th St.
Oakland, CA 94608
(415) 652-2411

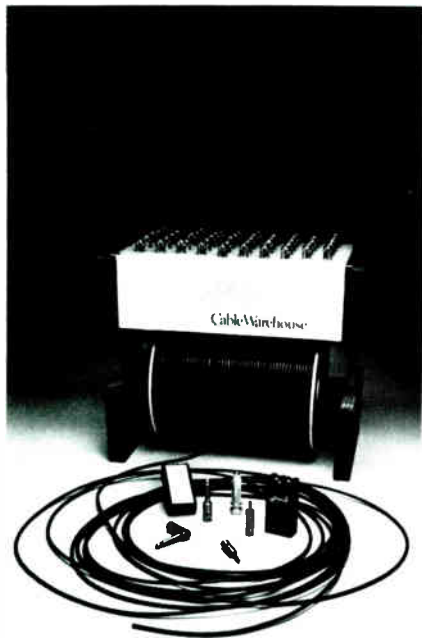
Product Name: 10½01 VHF

Contact: Royce Krlanowch

Date Product Introduced: June 27, 1987


Product Description & Applications: Low-cost VHF wireless systems. 201 VHF system includes diversity reception. Suggested list price, under \$300.

Basic Specifications & Suggested List Price: Operate on frequencies 170-216 MHz (VHF high band). Lavalier, hand-held and instrument systems available.



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 (615) 868-6976

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NEW PRODUCTS

MICROPHONES AND PICKUPS

1988

PASO SOUND PRODUCTS

14 First St.
 Pelham, NY 10803
 (914) 738-4800

Product Name: Handler's

Contact: David Moore, sales manager

Date Product Introduced: March, 1987

Product Description & Applications: Unidirectional Dynamic Microphones designed to withstand constant commercial and professional use. The mics non-reflective scratch and stain resistant housing repels dirt and maintains its original beauty. A redundant dual shock mount system reduces unwanted vibrations caused by handling.

Basic Specifications & Suggested List Price: Element: Dynamic frequency response: 40-18,000 Hz, polar pattern: cardioid; impedance: 250 ohms; output level: at 1,000Hz; power level: -57 dB (0 dB=1 mW/10 mbar), open circuit voltage: -77 dB 0.13 mV (0 dB=1 V/mbar); case: zinc die cast, finish: charcoal grey, cable: 15' detachable; accessories included: anti-shock holder carrying case. Price M800X \$194.70, M800F \$201.30, M800M \$201.30



ROSS SYSTEMS
"The Mic" Studio Electret Microphone

ROSS SYSTEMS

PO Box 2344
 Ft. Worth, TX 76113
 (817) 336-5114

Product Name: "The Mic" Studio Electret Microphone

Contact: Harvey Gerst, director

Date Product Introduced: June 27, 1987

Product Description & Applications: "The Mic" is a studio-quality recording microphone. Unique dual element capsule design, together with active FET electronics provides four switchable patterns: omni, cardioid, hypercardioid and figure-eight. Built-in 50Hz high pass filter and -10 dB pad can be used separately or in combination. Supplied with an 8-point studio shock mount suspension adapter and fitted hardwood storage case.

Basic Specifications & Suggested List Price: 10Hz to 18 kHz response with smooth phase coherence. Balanced XLR output connector. Standard matte black finish \$349.95 suggested list. Vintage studio matte grey finish \$399.95 suggested list.

ROSS SYSTEMS

PO Box 2344
 Ft. Worth, TX 76113
 (817) 336-5114

Product Name: RM-11L Microphone

Contact: Harvey Gerst, director

Date Product Introduced: June 27, 1987

Product Description & Applications: High performance dynamic microphone with shock mounted element for handheld or on-stage use. Cardioid pickup pattern. Rugged zinc-diecast construction with matte-black finish. Heavy gauge wire "ball-style" windscreen/pop filter. Built-in on/off switch. Basic Specifications & Suggested List Price: 30Hz to 18kHz response -72 dB sensitivity, 250 ohms impedance. Supplied with 20' heavy-duty cable terminated in XLR connectors. Mic stand adapter and storage case included. \$129.95 suggested list.

SAMSON TECHNOLOGIES CORP.

124 Fulton Ave.
 Hempstead, NY 11550
 (516) 489-2203

Product Name: Broadcast STD Series Wireless System

Contact: Kevin Moran, sales

Date Product Introduced: June, 1987 (NAMM)

Product Description & Applications: The Broadcast STD Wireless System is a true diversity type featuring dbx noise reduction. The transmitter and receiver are both channel selectable, featuring 10 VHF channels each. After selecting the best channel for operation on the receiver, the user dials up the same channel on the transmitter. This guarantees perfect wireless performance.

Basic Specifications & Suggested List Price: True diversity type, dbx noise reduction, 10-channel selectable, approximately \$2,000 list.

SANKEN MICROPHONE CO. LTD.

C/O PAN COMMUNICATIONS, INC.

Azabu Heights 607, 1-5-10

Roppongi, Minato-Ku

Tokyo, Japan, 106

(813) 505-5463

Product Name: Sanken CMS-7 (7H) Microphone

Contact: Masao Konomi, president

Date Product Introduced: March, 1987

Product Description & Applications: The Sanken CMS-7 is the first MS stereo portable condenser microphone in the world that accurately captures a natural stereo perspective in any environment. For indoor and outdoor TV and radio broadcasting and motion picture making, enables a single person to handle all outdoor stereo recording. Its special power supply/switchable matrix box CMS-MBB I or II, which clips to a belt and incorporates a stereo output jack for stereo headphone monitoring, allows direct connection to a field recorder.

Basic Specifications & Suggested List Price: Transducer type push-pull DC bias condenser, frequency response 50Hz to 20kHz; equivalent noise level: 19 dB or less; sensitivity at 1kHz: 10mV/Pa, diaphragm: titanium membrane (1 micron), maximum SPL for 1.0%THD at 1kHz: 130 dB, power supply CMS-MBB I or II with four 1.5V AA batteries or 48V phantom, suggested price \$2,430 for CMS-7 (H)/CMS-MBB I set, \$2,625 for CMS-7 (H)/CMS-MBB II set.

SEYMOUR DUNCAN

601 Pine Ave.
 Santa Barbara, CA 93117
 (805) 964-9610

Product Name: Live Wires™ Active Guitar Pickups

Contact: Ron Colantonio, marketing manager

Date Product Introduced: March, 1987

Product Description & Applications: Live Wires are available in Humbucker, Hot Strat and Classic Strat models. These 18-volt systems can be installed in calibrated sets or in conjunction with existing passive pickups. Each unit has its own preamp built-in for low noise and tone shaping. Live Wires provide great headroom, dynamic response and a more open sound.

Basic Specifications & Suggested List Price: Live Wire Humbucker-warm full tone, medium to high output, Alnico II magnets. Bridge only \$110 list. Set (one neck, one bridge) \$198 list. Live Wire Classic Strat-smooth active tone. Live Wire Hot Strat-extremely high output. Both Bridge \$98 list, Neck/Middle \$98 list. Set (neck, middle, bridge) \$250 list.

SHURE BROTHERS INC.

222 Hartrey Ave.
 Evanston, IL 60202
 (312) 866-2200

Product Name: SM84 Supercardioid Lavalier Microphone

Contact: Chris Lyons, marketing coordinator (312) 866-2540

Date Product Introduced: June, 1987

Product Description & Applications: Professional-quality condenser lavalier microphone designed for broadcasting and sound reinforcement. Supercardioid pickup pattern rejects unwanted sound "bleed" and permits greater gain-before-feedback. 730Hz dip filter reduces chest resonance, 12 dB/octave low-frequency rolloff reduces air and room noise. Side-exiting cable is easily replaced in minutes without soldering. Pre-amplifier/battery pack is fully shielded, may be worn on belt/waistband. Non-reflective black camera finish is inconspicuous on-camera. Easily adaptable to Shure Wireless microphone systems.

Basic Specifications & Suggested List Price: Frequency response: 80-20,000 Hz, output impedance: 150 ohms, open circuit voltage: -71 dB (0 dB = 1V/microbar), signal-to-noise ratio: 66 dB at 94 dB SPL, battery life: approx. 1,600 hours continuous use with fresh 9-volt alkaline (0.33 mA current drain), phantom voltage range: 5 to 52 VDC, net weight: microphone 1.58 oz, battery pack 9.45 oz (including battery). List price \$300.

TECHTONICS

719 Longfellow Ave.
Hermosa Beach, CA 90254
(213) 374-8872

Product Name: Beatmaster™

Contact: Jeffrey Pack, president

Date Product Introduced: January, 1987

Product Description & Applications: The Beatmaster drum triggers are the only triggers on the market that allow you to control the sensitivity and on/off switching at the drum! You no longer have to reach for your drum brain in the middle of a song or set. The sensitivity adjustment allows you to contour each drum's acoustic/electronic mix. It also enables you to eliminate false triggering. The pick-up plugs into the control box so the box can be removed from the drum without disturbing the pick-up. The pick-up is highly sensitive for superb tracking, even during the fastest or most delicate of passages.
Basic Specifications & Suggested List Price: The Beatmaster is available in two versions, SDT—to fit standard rims, or BDT—to fit bass drum hoops. Suggested retail price is \$36.95.

TELEX COMMUNICATIONS, INC.

9600 Aldrich Ave. S.
Minneapolis, MN 55420
(612) 887-5550

Product Name: FMR-4 Wireless Mic/Receiver

Contact: Gary Fisher, sales manager microphone products

Date Product Introduced: April, 1987

Product Description & Applications: Four-channel diversity receiver for wireless microphone applications. Easy to read monitoring for frequency, audio level and RF field strength Compressor circuit on/off and 110- or 220-volt are selectable.

Basic Specifications & Suggested List Price: Systems available within 165-216 MHz range with frequency response of 50-15,000 Hz and 108 dB dynamic range. Pro net price \$1,480 (receiver)

TELEX COMMUNICATIONS, INC.

9600 Aldrich Ave. S.
Minneapolis, MN 55420
(612) 887-5550

Product Name: HT-400 Wireless Mic/Transmitter

Contact: Gary Fisher, sales manager microphone products

Date Product Introduced: April, 1987

Product Description & Applications: Two-channel mic/transmitter with screwdriver gain control. On/off switch for audio and mic. Your choice of three popular mic heads include the Telex TE-10 condenser, Shure SM87 condenser and the Shure SM58 dynamic. Just plug in and screw on head of choice.

Basic Specifications & Suggested List Price: RF power out 45 mW with operating range of 1,000' line of sight or 300' (adverse). Mic with Telex TE-10 \$885, Shure SM58 \$990 and Shure SM87 \$1,095 pro net

AVEDIS ZILDJIAN COMPANY

22 Longwater Dr.
Norwell, MA 02061
(617) 871-2200

Product Name: ZMC-1 Cymbal Miking System

Product Description & Applications: The ZMC-1 cymbal miking system was developed after extensive research by Zildjian and Barcus-Berry. Not only does ZMC-1 provide the drummer with the ultimate in acoustic cymbal sound amplification but it also gives complete control over the sound and balance of any cymbal setup. With the ZMC-1 the drummer can combine clean acoustic sounds with built-in effects loops to allow artistic use of standard effects such as echo, reverb and flanging on individual cymbals.

Basic Specifications & Suggested List Price: The complete \$995 (retail) system consists of a six-input submixer and six phantom-powered electret condenser mics. Additional mics are \$105, and for larger cymbal setups, two mics can be combined through one channel via a "Y" cord. Mixer features six volume and pan controls, individual EQ on hi-hat input, left/right EQ controls and two effects loops.

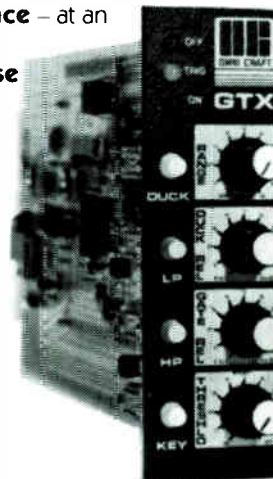
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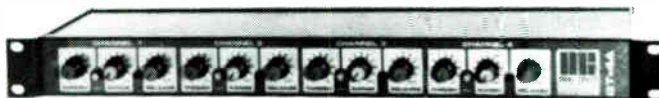
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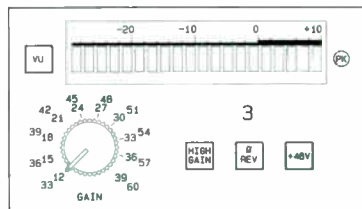
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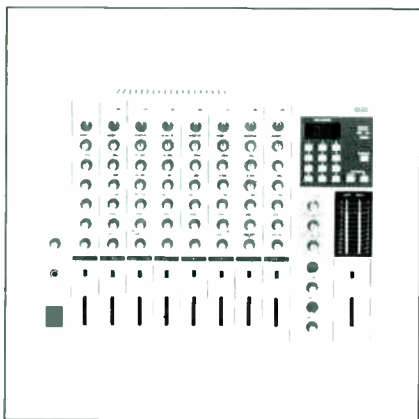
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**Don't miss the Third Annual
TEC Awards Celebration,
October 16, 1987, in New York
City. See page 146 for details.**

MIXING CONSOLES

1988

ACES (U.K.) LIMITED
 Featherbed Lane
 Shrewsbury, Shropshire, SY1 4NJ United Kingdom
 Product Name: Aces Seca
 Contact: A. Talbot, sales manager
 Date Product Introduced: APRS June, 1987
 Product Description & Applications: Seca in-line console 32/24 fitted 40 frame.
 Basic Specifications & Suggested List Price: Seca 32/24 console: fitted 19" patchbay, 8 auxiliary buses, P & G faders, semi-parametric EQ, logic switched routing system. Available later this year, will be an automation pack.



AKAI PROFESSIONAL
 MPX820 MIDI Programmable Audio Mixer

AKAI PROFESSIONAL
 PO Box 2344
 Fort Worth, TX 76113
 (817) 336-5114
 Product Name: MPX820 MIDI Programmable Audio Mixer
 Contact: Mike McRoberts, director
 Date Product Introduced: November, 1986
 Product Description & Applications: The MPX820 is an 8-channel programmable audio mixer with "snapshot" programming. Programmable functions are input and master fader, monitor send, 3-band EQ, effects send, pan, effects receive left and right; aux 1 and 2 level and pan; fade time. Fade time allows programs to fade in and out. The MPX820 accepts MIDI program change and can be controlled by sequencers for automated mixing. It can also sync-to-tape for program changing. A +4 dBm, XLR output unit is also available.
 Basic Specifications & Suggested List Price: THD: 0.1%; frequency response 20-20kHz; EIN: 128 dB; crosstalk: 70 dB; output: +20 dBm; fade time: 15 msec-15 seconds. \$2,499.95 standard model. \$2,919.95 +4 dBm model.

ALLEN & HEATH BRENNELL USA LTD.
 Five Connair Rd.
 Orange, CT 06477
 (203) 795-3594
 Product Name: Sigma M470 I/O Module
 Contact: Chuck Augustowski, VP/sales manager
 Date Product Introduced: August, 1987
 Product Description & Applications: The M470 is an I/O module for use in the Sigma Series of mainframe. Featuring dual input capabilities during mixdown, the M470 module has been optimized for electronic music recording where a large number of inputs are required. Separate input Trim controls are provided for mic input, line input and bus/tape monitor positions. A bus output trim is also included. A five-section EQ is incorporated that includes a continuously variable high pass filter and switchable Q on mid-sweep frequencies. HF and LF

frequencies can be selected between peaking and shelving characteristics. Up to 32-aux mixes can be derived from a Sigma console using M470 Modules during mixdown.
 Basic Specifications & Suggested List Price: Bandwidth ref: 1kHz-20Hz-1 dB, 20kHz-5 dB; microphone input noise: -127 dBm ref to 200-ohm input; group output noise: -90dB, distortion line in: typically 0.005% at normal operating level; inter-modulation distortion: less than 0.025%; maximum operating level: +22 dBv (9.75V RMS) 600 ohms.

AMEK CONSOLES INC.
 10815 Burbank Blvd.
 North Hollywood, CA 91601
 (818) 508-9788
 Product Name: APC 1000 Assignable Production Console
 Contact: Tim Wilson
 Date Product Introduced: November, 1986
 Product Description & Applications: The APC 1000 is a full-feature assignable production console featuring GML moving fader automation, recall of all knob settings with individual channel recall displays. All normal switches are removed from modules and controlled from a central control keyboard. The system allows fast setups of previous production sessions and the ability to store all switch and potentiometer settings to computer disk. Input configurations range from 32 to 128 inputs in 7 mainframe sizes.

AMEK CONSOLES INC.
 10815 Burbank Blvd.
 North Hollywood, CA 91601
 (818) 508-9788
 Product Name: G 2520 Master Recording Console
 Contact: Tim Wilson
 Date Product Introduced: January, 1987
 Product Description & Applications: The G 2520 Master Recording Console is a full function production console incorporating either digital grouping fader and mutes, or the GML moving fader system. It offers individual channel function displays, plasma metering, frequency response analyzer fully parametric 4-band EQ and high and low pass continually variable filtering. Additionally the G 2520 incorporates a centrally located monitor control panel also utilized by the APC 1000. The G 2520 is available in 40- and 56-input chassis sizes. The console can also be provided with an external patchbay.

AMEK CONSOLES INC.
 10815 Burbank Blvd.
 North Hollywood, CA 91601
 (818) 508-9788
 Product Name: Amek Classic Broadcast Television Production Console
 Contact: Tim Wilson
 Date Product Introduced: October, 1987
 Product Description & Applications: The Classic Television Production Console is unique in its compact module size of 30mm each. This allows 16 modules per 19", making it the most space-efficient console available today for broadcast production. Standard features include 4-band sweep EQ, 8 auxiliary sends switchable pre/post, 8 program buses and 2 stereo buses. Optional features include audio-follow-video serial interface and 24-track tape monitoring system.

AMEK CONSOLES INC.
 10815 Burbank Blvd.
 North Hollywood, CA 91601
 (818) 508-9788
 Product Name: TAC SR9000 Sound Reinforcement Super Console
 Contact: Tim Wilson
 Date Product Introduced: June, 1987
 Product Description & Applications: The TAC SR9000 is the result of many years' experience in the field of professional sound reinforcement. Key features include 16 auxiliary sends, 8 mute groups, 8 VCA groups, 16 subgroups, a 15 x 8 reduc-

tion matrix and a host of currently desired features. Optional features include a 24-input extender for a total capacity of 74 inputs.

ATI-AUDIO TECHNOLOGIES INC.
 328 Maple Ave.
 Horsham, PA 19044
 (215) 443-0330
 Product Name: Vanguard Series Audio Consoles
 Contact: Ed Mullin
 Date Product Introduced: April, 1987
 Product Description & Applications: BC12DSL is a 12-mixer, 24-input, dual bus stereo console utilizing VCA control of all level adjustments and all electronic switching controlled by a completely sealed membrane switch matrix. BC8DSL is an 8-mixer, 12-input dual stereo console with the same features.
 Basic Specifications & Suggested List Price: BC12DSL \$4,995, BC8DSL \$3,195

BIAMP SYSTEMS
 14270 NW Science Park
 Portland, OR 97229
 (503) 641-7287
 Product Name: Advantage System
 Contact: Ron Camden, sales manager
 Date Product Introduced: June 27, 1987
 Product Description & Applications: The Biamp Advantage System is a high performance, flexible microphone mixer system made up of four separate single rack-space modules. Advantage One consists of 8 input channels and a combination of output controls that meet requirements of installations ranging from board rooms to airline terminals. Advantage EX allows the mixer to expand to 32 inputs. Advantage AG expands the system to become a fully automatic microphone mixer with a priority switch on each channel. Advantage RC provides 4-channel VCA remote adjustment.
 Basic Specifications & Suggested List Price: Advantage One and EX modules: 8-input channels, discrete transistor front end, differential balanced inputs, 48-volt phantom power optional. Advantage One \$749, Advantage EX \$549; Advantage AG: adaptive threshold sensing (ATS) adjusts gate threshold level in response to changing ambient noise levels to minimize false gate openings, \$649; Advantage RC: up to 2,000' remote adjustment, \$399.

CALREC AUDIO LTD. (CALREC BY AMS)
 PO Box 31864
 Seattle, WA 98103
 (206) 633-1956
 Product Name: Computer Controlled Assignable Mixing System
 Contact: Nigel Branwell
 Date Product Introduced: April, 1987
 Product Description & Applications: A virtual console-free assignment of any fader to any channel, group or VCA Assignable control areas replace conventional channel strips. "Total Instant Reset"™ of all console settings. Three RAM and multiple disk-based memories of all settings. Up to 128 channels, eight stereo groups, four stereo outputs, 24- or 32-track recording groups and eight or 16 auxiliary groups. System comprises compact console with all audio circuits some distance apart. Two independent high-speed data links plus distributed intelligence allow for added security and fast operation.
 Basic Specifications & Suggested List Price: Mic inputs: -128.5 EIN with 32 dB input headroom (36 dB to special order); line inputs: +28 dBu max.; noise: -80, 20-20K, THD 0.07%, parametric EQ and comp./limiter/expander/gate same as line input. The circuit resolution on Assignable Channel Controls is 8-bit on input, gain, pan, aux send, frequency and EQ amplitude controls. The rotary controls are shaft encoders with positional indicator. Price on application.

CARVIN CORP.
 1155 Industrial Ave.
 Escondido, CA 92025
 (619) 747-1710
 Product Name: MX2488
 Contact: Neal Taylor, sales manager
 Date Product Introduced: January, 1987
 Product Description & Applications: Professional 8-track recording or large application live mixing console. Full control room and studio sections. Soloing and muting on all channels and outputs. Phantom power, cue, effects, independent mic/line inputs per channel. Full talkback and monitoring controls.
 Basic Specifications & Suggested List Price: -128 dB input noise. 20 dB headroom. Output noise -85 dB. 15 to 20kHz response. Harmonic distortion >.03%. Crosstalk -65 dB at 1kHz. -10 dBv outputs.

CETEC IVIE
 1366 West Center
 Orem, UT 84057
 (801) 224-1800

—CONTINUED ON PAGE 250



The Old School, circa 1835, Woodditton

It began again

in the old stone schoolhouse in the Village of Woodditton just outside of Cambridge, England. The name — FOCUSRITE. No one had ever heard of it, but the reputation of the designer was legendary.

He introduced it at Air Montserrat and George Martin dubbed it "The Sound Alternative."

Today Focusrite has become the "talk of the industry."

The ISA series is only a beginning. Thanks to these professionals across the U.S. and Canada, we are proud to celebrate our first anniversary. Cheers!

Studios

A & M STUDIOS, Los Angeles / AIR MONTSERRAT, Montserrat
BLUE REEF MUSIC, New York / THE CASTLE, Franklin, TN
CRITERIA RECORDING, North Miami, FL / ELECTRIC LADY, New York
HIT FACTORY, New York / DAVID HUFF RECORDING, Forest, MS
HYPNOTIC PRODUCTIONS, Thornhill, Ontario
INTERNATIONAL SOUND, No. Miami, FL
LARABEE SOUND, Los Angeles / LE STUDIO, Morin Heights, Quebec
LUCAS FILM, Los Angeles / MAME PRODUCTIONS, Minneapolis, MN
METRO STUDIOS, Minneapolis, MN / PAISLEY PARK STUDIOS, Minneapolis, MN
RIGHT TRACK STUDIOS, New York / ROYAL RECORDERS, Lake Geneva, WI
SKIP SAYLOR RECORDING, Los Angeles / SKYLINE STUDIOS, New York
SOUNDSTAGE STUDIO, Ft. Lauderdale, FL / SPYDER'S SOUL KITCHEN, Los Angeles
STUDIO A, Dearborn Heights, MI

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EARL COHEN, Middletown, CT / LYNN FUSTON, Nashville, TN
STEVEN KRAUSE, Los Angeles / ROBERT NORRIS, New York
DOUG ROSE, Suffern, NY / CARL TATZ, Nashville, TN
GABE VELTRI, Los Angeles

Rental Houses

DESIGN EFFECTS, Los Angeles / DIGITAL DISPATCH, Burbank, CA
HARRIS AUDIO, Miami, FL / A.T. SCHARFF RENTALS, New York
TELE-TECH ELECTRONICS, Toronto, Ontario / TOY SPECIALISTS, New York

Focusrite — Electro-Acoustic design engineers. Equalizers and microphone amplifiers available in outboard racks and complete custom consoles.

U.S./CANADIAN DISTRIBUTOR: FOCUSRITE US LTD, attn: Dan Zimbelman
1100 Wheaton Oaks Court, Wheaton, Illinois 60187, (312) 653-4544
WEST COAST REP: Audio Intervisual Design
1032 North Sycamore, Los Angeles, CA 90038, (213) 469-4773

Focusrite
The Sound Alternative.

Product Name: 2502/3 Automatic Microphone Mixer
Contact: Glen E. Meyer
Date Product Introduced: April, 1987
Product Description & Applications: I've will be showing two new competitively priced rack-mountable automatic mixers. Besides the four automatic microphone/line transformer balanced inputs, the mixers have three additional inputs that can be used for emergency and normal paging, background music and other sources where automatic channel turn-on switching is not required. The 2502/5502 also has a removable (with a 10K pot) VCA control on the master and the 2503/5503 has VDC controls on 5 inputs and master output.
Basic Specifications & Suggested List Price: The mixers have a "last on" feature (built-in option) that leaves the last channel used on until another channel is turned on which creates a more natural recording or overflow feed. Frequency response is 20Hz to 20kHz ± 5 dB, equivalent input noise is -127 dBm per channel, A weighted; THD is .07%, maximum gain is 85 dB, phantom power is $+48$ VDC, max output level is $+18$ dBm (transformer balanced), and channel off attenuation is 0 to -90 dB. Industrial net price is \$1,575 for the 2502 and \$1,734 for the 2503.

CIRCUIT DESIGN TECHNOLOGY, INC.

26801 Richmond Rd.
 Bedford Heights, OH 44146
 (216) 292-0491
Product Name: Maxcon
Contact: Bruce Forbes, marketing mgr
Date Product Introduced: September, 1987
Product Description & Applications: An expandable (up to 32 x 8) rack-mountable mixing console with 16 inputs, eight subgroups, eight aux sends, eight aux returns and 16 tape returns. Featuring ultra low noise mic preamps with loop thru XLR's for splitter applications 3-band parametric EQ balanced buses.
Basic Specifications & Suggested List Price: Microphone preamp input noise better than -128 dB EQ. 3 sweepable bands with -40 dB notch capability and 12 dB boost. All faders are high quality carriage type. Inputs: mic in, line in, tape return, loop in (x16); outputs: (loop outs on input modules) sub direct outs (x8) left, right and mono, tape outs (x16).

CONNECTRONICS CORPORATION

652 Glenbrook Rd.
 Stamford, CT 06906
 (203) 324-2889
Product Name: Seck 1282
Contact: Richard Chivers, exec. VP
Date Product Introduced: Late 1986
Product Description & Applications: Twelve-input with eight subgroups to stereo portable audio mixing console, with 12-input monitor section. Designed for recording or live applications. Six aux sends at mixdown, four aux returns, stereo solo bus, weighs only 30 lbs. Power supply external 4.5 lbs.
Basic Specifications & Suggested List Price: \$4,140. Signal to noise 124 dBu, mic line tape inputs, 3-band EQ (sweep mid), 2 headphone O/P. Full throw alps faders (100mm)

D & R U.S.A.
 1720 Chip N Dale Dr.
 Arlington, TX 76012
 (817) 548-1766

Product Name: Distec Mixer
Product Description & Applications: This 19" rack mount mixer can be used as a "high quality" discotheque mixer or a keyboard mixer. The fully modular system can except ten input modules, mono mic/line or stereo RIAA/line, with 3-band EQ, aux send, solo (PFL) and long-throw faders. This product is intended for high tech applications, but at the same time is very "user friendly".

D & R U.S.A.
 1720 Chip N Dale Dr.
 Arlington, TX 76012
 (817) 548-1766

Product Name: D & R Dayner In-Line Series
Date Product Introduced: Summer, 1987 NAMM
Product Description & Applications: With the many demands for more inputs in the MIDI explosion, D & R Electronica b.v. Weesp, Holland has introduced an in-line module for their already popular Dayner Series mixing console. The new module has eight aux send buses, eight floating sub groups, complete monitor section, fader reverse, split EQ, two sets of patch points per module and all the standard features from the Dayner. With a 62-unit chassis, you can have 56 in-line modules with 112 returns to the mix bus and still have blank modules.

NEW PRODUCTS

MIXING CONSOLES

1988



D & R U.S.A.
Dayner In-Line Series

DDA
 30 B Banfi Plaza N.
 Farmingdale, NY 11735
 (516) 249-3660
Product Name: DDA In-Line Recording Console
Contact: Jack Kelly, president
Date Product Introduced: June, 1987
Product Description & Applications: Up to 56 inputs w/dual signal architecture, 32 output buses, choice of mic, line, or instrument level into preamps, 10 auxiliary buses, switchable insert point, split equalizer/filter design, TT patchbay, fader automation available. Central control of the majority of module switching functions. All centrally controlled functions can be stored as complete console snapshot or presets, for floppy recall, either manually or against SMPTE timecode. Floppy disk storage of parameters. Internal SMPTE reader/generator.
Basic Specifications & Suggested List Price: To be announced.

HARRISON SYSTEMS, INC.
 PO Box 290157
 Nashville, TN 37229
 (615) 834-1184
 (615) 834-1365 FAX
 555133 Telex
Product Name: Pro-7e (tentative name)
Contact: Martin Burns
Date Product Introduced: October 1, 1987
Product Description & Applications: Total re-design of existing Pro-7 production/edit suite console. Features include full LED annunciation of all switch functions, new frame size and styling, configurable with or without stereo grouping, editor/switcher interface conforming to ESAM II Serial protocol, mono mic/line input modules and/or stereo line input modules, 8 x 1 stereo input pre-selectors available as well as many other optional components.
Basic Specifications & Suggested List Price: Four mainframe sizes available ranging from 12-input modules up to 28-input modules. Prices range from \$15,000 to \$35,000.

HARRISON SYSTEMS, INC.
 PO Box 290157
 Nashville, TN 37229
 (615) 834-1184
 (615) 834-1365 FAX
 555133 Telex
Product Name: AIR-7e (tentative name)
Contact: Martin Burns
Date Product Introduced: May 1, 1987
Product Description & Applications: Total re-design of existing AIR-7 radio on-air console. Features include full electronic switching on all signal routing, full LED annunciation of all switch functions, new frame size and styling, configurable with three types of input modules, fully implemented B input machine interface logic on stereo line input modules, new clock/timer control interface, as well as many other optional components available.
Basic Specifications & Suggested List Price: Four mainframe sizes available ranging from 12 inputs modules of various types to 28-input modules. Prices range from \$12,000-\$300,000.

HILL AUDIO INC.
 5002B N. Royal Atlanta Dr.
 Tucker, GA 30084
 (404) 934-1851
Product Name: Concept Series
Contact: Bob Allun, national sales manager
Date Product Introduced: June, 1987
Product Description & Applications: The "Concept" range of consoles comprises the 2200 (8-bus) and 3200 (16-bus)—8 aux sends, VU meters throughout and the 4400 (8-bus), 5400 (16-bus), 6400 (16-bus), 8400 (24-bus)—12 aux sends LED displays throughout, two programmable mute systems, true solo-in-place, optional 8 x 8 matrix or 8 x 16 matrix, 8- to 48-track monitoring, 100mm faders, optional DC controlled subgroups, optional patchbay, optional VCA controlled faders. All the consoles in the "Concept" range feature the "side-tracker" EQ system—6-band fixed frequency active filters with centers at: 60Hz, 150Hz, 500Hz, 1.5kHz, 4.5kHz and 12.5kHz ± 12 dB and a high-Q filter sweepable from 50Hz to 5kHz, -24 dB to $+6$ dB.
Basic Specifications & Suggested List Price: \$15,000 to \$54,000.

JVC COMPANY OF AMERICA
PROFESSIONAL VIDEO COMMUNICATIONS DIV.
 41 Slater Dr.
 Elmwood Park, NJ 07407
 (800) JVC-JVC-5
Product Name: DS-CS900
Contact: Larry Boden, special product mgr., JVC
Date Product Introduced: June 1, 1987
Product Description & Applications: The DS-CS900, a disk-based PQ Subcode Information Control System, allows users to save and store on one disk both PQ subcodes and information, along with automated data from the DS-DM900 mixer/ equalizer.
Basic Specifications & Suggested List Price: Price available from Larry Boden (213) 537-6020.

MIDAS AUDIO SYSTEMS
 54-56 Stanhope St.
 London, NW1 3EX England
 (02) 388-7060
Product Name: XL Series Mixing Consoles
Contact: Peter Cornell, sales manager
Date Product Introduced: Autumn, 1987
Product Description & Applications: Building on the successful launch of the XL System last year, Midas is pleased to offer an enhanced series of retrofittable modules. The XL04A input, with fully parametric mid bands, sweepable treble and bass and hi-cut filter, the XL08A dual input, for two independent line inputs with full equalization and routing facilities, and the XL11A stereo subgroup module. A comprehensive 8-way output matrix is available by specifying XL12A subgroups and XL18A outputs.
Basic Specifications & Suggested List Price: Console formats comprise 24, 32 or 40 inputs. Outputs vary between 8 mono groups, 8 stereo groups and 8 dual routing to a 2-way matrix master pair and record pair, and a B/B matrix can be specified. 8 auxiliary outputs are standard. Prices start at around \$33,000.

MITSUBISHI PRO AUDIO GROUP
 225 Parkside Dr.
 San Fernando, CA 91340
 (818) 898-2341
Product Name: Westar 8300 Film Re-Recording Console
Contact: Bill Windsor, senior marketing exec.
Date Product Introduced: October, 1987
Product Description & Applications: The Film Re-Recording Console uses a newly developed film input module with a two- and three-channel pan pot; 8, 16, or 24 mixing buses, ten auxiliary buses; top panel plug-in equalizer, top panel plug-in dynamics unit or microphone preamplifier; and A/B line inputs with trim. A choice of fader systems include audio, VCA with sub-groups, tape and PC computer automation, and hard disk automation with Intelligent Digital Faders. Other modular devices are film monitor panels with 8 x 4 to 24 x 8 matrix select systems with dedicated monitor format buttons, recorder and bus/film push-button control panels, 8 to 24 tracks; re-assign, transfer key and mono and stereo composite modules, multi-track pre-dub input modules and peripheral processing devices.
Basic Specifications & Suggested List Price: The console is constructed of plug-in wiring. 32-input VCA Console is \$144,000.

NEOTEK CORPORATION
 1158 W. Belmont Ave.
 Chicago, IL 60657
 (312) 929-6699
Product Name: elan Console System
Contact: Susan L. Gosstrom, sales manager
Date Product Introduced: November, 1986
Product Description & Applications: The NEOTEK elan provides contemporary multi-purpose recording studios with exceptionally flexible signal flow architecture, bandwidth and

isolation performance to handle multiple synthesizer tracks and noise and distortion superior to digital recorders. Input modules feature microphone and line inputs, four-band sweep equalizer, six auxiliary sends, assignment to 24 multi-track buses and a high resolution bargraph meter. The elan affords a second input through each module, doubling the console's capacity to provide 72 inputs and 30 auxiliary buses in a six-foot wide frame.

Basic Specifications & Suggested List Price: Bandwidth: 20Hz-20kHz \pm 2 dB, distortion mic or line input to stereo output: 0.1% noise 1 channel to stereo master, 27 muted, -88 dBu, crosstalk stereo L/R through channel pan -94 dB, between multi-track buses: -96 dB.

RUPERT NEVE INCORPORATED

Berkshire Industrial Park
Bethel, CT 06801
(203) 744-6230

Product Name: Digital Transfer Console (DTC)

Contact: Anthony H. Langley, VP sales

Date Product Introduced: AES, November, 1986

Product Description & Applications: Total digital control and processing using virtual concept for compact disc tape transfer and mastering, the DTC is one of Neve's ever-expanding digital products range. A joint-design project with Sterling Sound and Masterdisk in New York and Disc Mastering, Inc. in Nashville. Full digital processing for all current standards with six bands of constant Q Digital Formant Spectrum Equalization and filtering, together with an integrated expander, gate, compressor having external side-chain control, and "zero" attack limiter.

Basic Specifications & Suggested List Price: Two digital and an analog stereo input with mix and/or crossfade facilities including full level, balance and trim. 250 snapshots of console settings on floppy disk sequenced manually or automated under SMPTE time code, with instant reset and preview for memory. 200-segment digital plasma meters with absolute peak indication for sources, and hold and compare facilities, together with side-chain indication for dynamics.

PACIFIC RECORDERS & ENGINEERING CORPORATION

2070 Las Palmas Dr.
Carlsbad, CA 92009
(619) 438-3911

Product Name: Stereomixer™

Contact: John F. Kenyon

Date Product Introduced: March 28, 1987

Product Description & Applications: The Stereomixer is a new high-performance, full-feature audio mixer primarily intended for use in applications such as: public affairs, talk shows, remotes, music and commercial transfers, auxiliary production, on-air and stereo news broadcasts.

Basic Specifications & Suggested List Price: Eight universal input positions will accept any combination of mic inputs, line inputs, tape recorder in/out, telco in/out, or stereo equalizers and voice processor modules. Typical price ranges from \$4,000 to \$6,000—depending on configuration.

PANASONIC RAMSA

6550 Katella Ave.
Cypress, CA 90630
(714) 895-7277

Product Name: Model WU-8119 Surround Sound Module

Contact: Steve Woolley, sales & mkt. mgr

Date Product Introduced: October, 1987

Product Description & Applications: The WU-8119 Surround Sound Module adapts Ramsa's new WR-842B Post-Production/Recording Console for surround sound applications including Dolby Stereo™ cinema surround mixdowns and other cinema, broadcast and professional playback surround sound mixdowns.

Basic Specifications & Suggested List Price: Suggested retail: \$1,800

PANASONIC RAMSA

6550 Katella Ave.
Cypress, CA 90630
(714) 895-7277

Product Name: WR-S852 40-input Modular Sound Reinforcement Mixing Console

Contact: Steve Woolley, sales & mkt. mgr

Date Product Introduced: October, 1987

Product Description & Applications: Exceptionally high-performance modular sound reinforcement mixing console. 300,000 cycle faders, detented pots, 4-band quasi-parametric EQ + HP, all inputs, outputs and patch points are balanced, instrumentation-type discrete front end, full metering, peak/run LEDs, 40-input modular mainframe, eight group eight aux, two main mixing buses, 8 x 11 output matrix, optional submix input module for up to 160 mic/line inputs, worst case 85 dB crosstalk, 0.003% THD at +18 dB output.

Basic Specifications & Suggested List Price: Inputs: up to 40 mono input modules or up to 20 8-input submix modules (160 inputs, or combination such as 24 mono, 8 submix.) Also eight effects and eight aux inputs; matrix: 8 x 11 output matrix;

crosstalk: < -85 dB worst case channel to channel or from any input to any output; distortion: < 0.003% THD at +18 dB

PANASONIC RAMSA

6550 Katella Ave.
Cypress, CA 90630
(714) 895-7277

Product Name: Model WR-S840 Modular Stage Monitor Mixing Console

Contact: Steve Woolley, sales & mkt. mgr

Date Product Introduced: October, 1987

Product Description & Applications: Stage monitor mixing console with 40-input channel modular mainframe, 18 mono sends per input channel switchable to four stereo sends per module, switch-configurable pre/post, on/off, 300,000 cycle faders, detented pots, fully balanced inputs, outputs and patch points, discrete instrumentation front end, exceptional performance specifications.

Basic Specifications & Suggested List Price: Inputs: up to 40 input modules, sends: 18 discrete or four stereo per input module, matrix: 8 x 11 output matrix; crosstalk: < -85 dB worst case channel to channel or from any input to any output; distortion: < 0.003% THD at +18 dB output; suggested retail: approximately \$23,000 typical (depending on module selection).

output, suggested retail: approx. \$23,000 typical (depending on module selection)

PANASONIC RAMSA

6550 Katella Ave.
Cypress, CA 90630
(714) 895-7277

Product Name: Modular Post-Production/Recording Mixing Console Model WR-842B

Contact: Steve Woolley, sales & mkt. mgr

Date Product Introduced: January 15, 1987

Product Description & Applications: Modular post-production/recording console with 28 input channels (mono or stereo), four group outputs (basic or monitor), two send outputs (basic or monitor), four matrix outputs (8 x 1) and a unique "2nd 24-track" mixdown matrix. Other important features/specs include extremely low noise and crosstalk, exceptional rejection of external hum and noise, 100,000 cycle Panasonic faders, electronically balanced (hybrid IC) input and output stages and extensive metering.

Basic Specifications & Suggested List Price: THD < 0.05%, EIN < -125 dB, 20-20kHz, mic in to group out, crosstalk: better than -60 dB channel to channel or channel to group, CMRR: > 70 dB at 1kHz at mic in; frequency response: (+0.5, -2 dB) 20Hz to 20kHz mic in to group out, suggested list: under \$20,000 typical configuration

THANK YOU THANK YOU THANK YOU

Mix Publications wishes to thank everyone listed below for throwing such an outstanding party in Los Angeles celebrating our Tenth Anniversary!



TAKE ONE RECORDING STUDIOS, INC.



**AMEK
AMIGO STUDIOS
AMPEX
AUDIO EXPRESS
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DIGITAL DISPATCH
FOSTEX
KORG
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**MIDILAND/GREENGATE
MITSUBISHI
NEUMANN
NEW WEST AUDIO
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STUDIO MANAGEMENT
SOFTWARE SYSTEMS
TANNOY**

Let's make the next ten years just as successful...and we'll all party together at Mix's 20th Anniversary!

MIX

Circle #199 on Reader Service Card

PEAVEY ELECTRONICS

PO Box 2898
Meridian, MS 39301
(601) 483-5365

Product Name: MD-421

Contact: Hollis Calvert, product manager
Date Product Introduced: June, 1987

Product Description & Applications: The MD-421 is a full-function four-output mixer with a combination of features, performance and versatility rivaling consoles at twice the price. The specially designed input stage affords extremely low-noise operation and 60 dB of gain. Channel features include overload LED indicators, 100mm faders, three-band EQ with sweepable mids, 4-sub assignments, two effects sends, one auxiliary send (pre or post), PFL/headphone capability, balanced XLR inputs and more. The MD-421 is available in 16- or 24-channel versions.

Basic Specifications & Suggested List Price: Suggested U.S. list price: MD-421 16-channel \$1,699.50, MD-421 24-channel TBA

PEAVEY ELECTRONICS CORPORATION

PO Box 2898
Meridian, MS 39301
(601) 483-5365

Product Name: PKM 8128/PKM 8128E (Programmable Keyboard Mixers)

Contact: Ken Valentine, product manager
Date Product Introduced: June, 1987

Product Description & Applications: The Peavey PKM 8128 is a MIDI programmable 8-channel, stereo mixer designed primarily for multi-keyboard applications. Each channel features programmable level, effects send level for 3 effects buses, monitor level, pan and mute. Channel and mix parameters are displayed in a large 40-character by 2-line LED window. Parameter adjustments are done via soft key controls or via the alpha-dial whose function is dependent on the parameter selected. Channel expansion is made possible with the addition of the PKM 8128E. As many as three 8128E units may be added to the 8128 for a total of 32 channels.

Basic Specifications & Suggested List Price: The PKM 8128 is packaged in a standard 19" rack chassis and occupies only 2 rack spaces. The PKM 8128E is one rack space high. Suggested U.S. list price: \$899.50 (PKM 8128), \$699.50 (PKM 8128E).

PRECISION DESIGN

27106 46th Ave. S.
Kent, WA 98032
(206) 852-5070

Product Name: ROAM-8

Contact: Brian Hayashi
Date Product Introduced: May, 1987

Product Description & Applications: ROAM-8 is a remote on-location audio mixer providing eight inputs of mic or line level audio. Each channel has 3-band EQ. In addition, pink noise and peak limiter are onboard. ROAM-8 is AC/DC power equipped and may feed a phone line directly or feed line out. Comes in a durable portable case.

Basic Specifications & Suggested List Price: Gain > 65 dBm, freq. response 20Hz-20kHz ± 0.2 dBm, THD 0.01%, IMD 0.01% (SMPTE), EIN -109 dB, EQ section boost or cut ± 18 dB, weight 13.75 lbs.

RANE CORPORATION

6510 216th SW
Mountlake Terrace, WA 98043
(206) 774-7309

Product Name: HM 42 Headphone Mixer

Contact: Terry Pennington
Date Product Introduced: June, 1987

Product Description & Applications: Four stereo line inputs with level controls mix down to two stereo headphone amplifiers, with separate level controls. Allows headphone monitoring of four stereo inputs such as keyboards, drum machines or other inputs. Two or more can be linked via expand in/out, or connected to HC6.

Basic Specifications & Suggested List Price: THD and noise: less than 0.05%; signal-to-noise ratio: 96 dB below max output; max. gain: 35 dB; size: 1.25" H x 19" W x 5.25" rack depth. Suggested list price \$329.

SHURE BROTHERS INC.

222 Hartrey Ave.
Evanston, IL 60202
(312) 866-2200

Product Name: FP51 Gated Compressor/Mixer

Contact: Chris Lyons, marketing coordinator (312) 866-2540
Date Product Introduced: June, 1987

Product Description & Applications: Portable 4-input, 1-output audio mixer combined with true average-responding compressor circuitry provides adjustable 40dB compression range. Automatically adjusts master gain to maintain constant output level. Unique gated metering minimizes "pumping", adjustable response rate control allows use with a variety of program material. Transformer-coupled XLR input and output, each switchable for mic/line operation. Also features low-cut

NEW PRODUCTS**MIXING CONSOLES**

1988

filters, 1kHz tone oscillator, phantom power. Illuminated meter indicates output VU, dB compression and battery condition. **Basic Specifications & Suggested List Price:** Compressor attack time: 3 msec for increases > 15 dB, 120 msec-6 sec for increases < 15dB; recovery time: 120 msec to 6 sec (adjustable); operating voltage: 120 or 240 VAC (internally selectable); three 9-volt alkaline batteries provide approx. 10 hours continuous operation. Dimensions: 3 1/4" x 12 7/8" x 9 1/2"; weight: 6 lbs, 1 oz. UL listed, CSA certified. List price \$940.

SOLID STATE LOGIC

Begbroke
Oxford, England
(08675) 4353

Product Name: SSL G Series Studio Computer

Contact: Bill Aitken, head of marketing
Date Product Introduced: March, 1987

Product Description & Applications: The G Series Studio Computer uses the latest high-speed hardware with fast processor, vast onboard memory and high capacity (20 megabyte data cartridges). One data cartridge will store the same amount of information as 80 conventional floppy disks. Information can be loaded, processed, edited and copied faster than ever before. G Series is compatible with floppy disks produced on E Series Studio Computers. A G Series Studio Computer will be standard on new SL 4000 and SL 6000 E Series consoles and is retrofittable to existing studio computers.

Basic Specifications & Suggested List Price: The G Series Studio Computer system includes new high performance hardware and G Series software together with a pair of floppy drives alongside the drives housing the G Series 20 megabyte data cartridge and optional G Series remote keyboard.

SOLID STATE LOGIC

6255 Sunset Blvd., Ste. 1026
Los Angeles, CA 90028
(213) 463-4444

Product Name: SSL New EQ & Input Cards

Contact: Andy Wild
Date Product Introduced: June 22, 1987

Product Description & Applications: These cards may be retrofitted to any SL 4000 E Series console, allowing existing SSL clients to benefit from the latest SSL developments in sonic performance. Greater musicality is achieved by employing the most advanced design techniques in conjunction with, most importantly, a wide range of subjective listening tests by professional audio experts.

SONY PROFESSIONAL AUDIO

1600 Queen Anne Rd.
Teaneck, NJ 07666
(201) 833-5200

Product Name: MXP-3036VF

Contact: Andy Nelles, product manager
Date Product Introduced: January, 1988

Product Description & Applications: Sony's popular MXP-3000 Series Mixing Console has been enhanced by a completely new bargraph metering system which provides greater accuracy and readability. This revolutionary vacuum fluorescent system features switchable ballistics: VU, peak (Nordic, DIN and BBC) and DC and adjustable peak hold circuitry. **Basic Specifications & Suggested List Price:** The MXP-3000 Series has been further enhanced by the addition of wild fader options. These options provide up to eight additional faders which are user assignable as group master, automated echo returns and much more.

SOUND WORKSHOP PROFESSIONAL

AUDIO PRODUCTS INC.
50 Werman Ct.

Plainview, NY 11803
(516) 756-0140

Product Name: Series 34C Record/Mix Console

Contact: Lee Pomerantz, sales manager
Date Product Introduced: April, 1987

Product Description & Applications: The Series 34C is now available with Diskmix Moving Faders from Digital Creations Corp. System installation is available at the factory for new orders or for field retrofit to all existing Series 34s. Diskmix Moving faders is a time code driven fader and mute automation system that allows an unlimited number of mixes to be stored on hard or floppy disks and features multiple processors with conversion to 10-bit precision. Since the audio signal passes through only the resistive element of the latest Penny & Giles motorized fader design, total sonic integrity is maintained. Menu driven system operation is both highly informa-

tive as well as easily learned and operated. Please contact your Sound Workshop dealer or the factory for system pricing and availability.

SOUND WORKSHOP PROFESSIONAL AUDIO PRODUCTS INC.

50 Werman Ct.
Plainview, NY 11803
(516) 756-0140

Product Name: ADR/Foley Console

Contact: Lee Pomerantz, sales manager
Date Product Introduced: April 15, 1987

Product Description & Applications: The ADR/Foley Console is designed to meet the exact requirements of production work on ADR/Foley stages. Based on a modular design, the console features 6 microphone inputs with complete 24-track monitoring. All monitoring and multiple machine control functions are carried out from a custom hardware/software package designed by Larson Technology of Burbank, California. This comprehensive system allows for complete automation of the ADR/Foley process bringing about greater speed of operation and efficiency.

Basic Specifications & Suggested List Price: Please contact your Sound Workshop dealer or the factory for the exact system specifications and pricing.

SOUND WORKSHOP PROFESSIONAL AUDIO PRODUCTS INC.

50 Werman Ct.
Plainview, NY 11803
(516) 756-0140

Product Name: VD-3 Video Dub Console

Contact: Lee Pomerantz, sales manager
Date Product Introduced: October, 1987

Product Description & Applications: The VD-3 is a three-man video dubbing stage console. Features include onboard graphic equalizers, integrated software definable machine control/monitor switching and the Diskmix automation package from Digital Creations Corp. The VD-3 carries forth the Sound Workshop design principles of sonic integrity achieved by minimal stage count and system design for flexibility and ergonomic ease of operation.

Basic Specifications & Suggested List Price: Please contact the factory for system configurations and pricing.

Soundcraft

SOUNDCRAFT USA
Soundcraft Fame

SOUNDCRAFT USA

8500 Balboa Blvd.
Northridge, CA 91329
(818) 893-4351

Product Name: Soundcraft Fame

Contact: David Kimm, sales manager
Date Product Introduced: June, 1987

Product Description & Applications: Automation system for the TS12 in-line recording console providing disc-based SMPTE driven real time automation. Automates mix fader and cut, channel cut, three aux on/off switches and EQ in/out. **Basic Specifications & Suggested List Price:** Prices from \$15,500.

SOUNDCRAFT USA

PO Box 2200, 8500 Balboa Blvd.
Northridge, CA 91329
(818) 893-4351

Product Name: TS12

Contact: David Kimm, sales manager
Date Product Introduced: June, 1987

Product Description & Applications: Twenty-four- or 36-channel in-line recording console, 4-band EQ, 6 aux sends with user programmable options, 12 bus or 6 stereo subgroups, 7 stereo returns with full routing and EQ, integral patchbay, fader and bounce facilities greatly enhance console versatility.



SOUNDCRAFT USA
TS12

automation available to automate mix fader and cut, channel cut, EQ in/out, aux send on/off, choice of either VU or bargraph meters, full 24T or 32T interface.

Basic Specifications & Suggested List Price: Distortion at +10 dBu 1kHz < 0.005%, 10kHz < 0.01%, mic noise EIN -128.5 dBu, freq. response at +10 dBu 20Hz -0.5 dB, 20kHz -1.0 dB, max O/P +26 dBu, crosstalk: Input to any unrouted bus -90 dB. Prices from \$27,500.

SOUNDCRAFT USA
8500 Balboa Blvd.
Northridge, CA 91329
(818) 893-4351

Product Name: Soundcraft Series 8000
Contact: David Kimm, sales manager
Product Description & Applications: 16-, 24-, 32- or 40-input matrix 8 bus sound reinforcement console available with eight effects returns or 8 x 8 matrix outputs. Input module features 4-band semi-parametric EQ, high pass filter, eight aux sends, individual group routing, option of 20-segment bargraph input meter or four VCA subgroup system. Stereo input

modules available with 4-band fixed frequency EQ and routing to buses in pairs.

Basic Specifications & Suggested List Price: Distortion at +20 dBu 1kHz < 0.006%, 10kHz < 0.012%, mic noise EIN -128 dBu. Frequency response at +10 dBu 20Hz -0.8 dB, 20kHz -0.05 dB. Group output bus noise -94 dBu. Typical mix noise (24-channel routed) -74 dBu. Prices from \$18,950.

SOUNDCRAFT USA
8500 Balboa Blvd.
Northridge, CA 91329
(818) 893-4351

Product Name: Series 600 Producer
Contact: David Kimm, sales manager
Date Product Introduced: January, 1987
Product Description & Applications: Twenty-four- or 32-input 8 bus recording console, split monitoring up to 24T, with optional internal patchbay, 20 segment LED metering for tape sends/returns, full 16T or 24T interface, stereo channels available.

Basic Specifications & Suggested List Price: Distortion at +20 dBu 1kHz < 0.005%, 10kHz < 0.015%, mic noise EIN -128 dBu. Frequency response at +10 dBu 20Hz -0.5 dB, 20kHz -1.0 dB. Group output bus noise -94 dBu typical mix noise (24-channel routed) -81 dBu. Prices from \$9,150.

SOUNDCRAFT USA
8500 Balboa Blvd.
Northridge, CA 91329
(818) 893-4351

Product Name: Soundcraft Series 500 Monitor
Contact: David Kimm, sales manager
Product Description & Applications: Sixteen-, 24-, 32- or 40-input 12 bus stage monitor console. Input module features 4-band equalizer with sweep freq. on 2 mid range, 12 individual sends to monitor group outputs, rotary channel level control, output group features 100mm fader and 3-band EQ with fully parametric mid band.

Basic Specifications & Suggested List Price: Prices from \$8,350

SOUNDCRAFT USA
8500 Balboa Blvd.
Northridge, CA 91329
(818) 893-4351

Product Name: Soundcraft Series 200BVE

Contact: David Kimm, sales manager

Date Product Introduced: September, 1987

Product Description & Applications: A version of the famous 200B adapted to work with video editors to enable crossfades totally under editor control. Interfaces directly with Sony BVE-900, other interfaces will be available later in the year. An additional fader sets the maximum fade depth. Available on STD or sweep EQ input modules.

Basic Specifications & Suggested List Price: Price on application.

SOUNDTRACS PLC.

91 Ewell Rd.
Surbiton Surrey, KT6 6AH England
(01) 399-3392

Product Name: Soundtracs MX Series
Contact: John Carroll, sales & marketing director

Date Product Introduced: June, 1987
Product Description & Applications: MX Series: A modular sound reinforcement console available with up to 40 inputs with or without input metering. Stereo inputs are available as a factory-fitted option. Applications include concert sound systems, outside broadcast vehicles, theater and multi-track recording.

Basic Specifications & Suggested List Price: 24-8-2, 32-8-2, 40-8-2. Optional stereo line input modules available.

SOUNDTRACS PLC.

91 Ewell Rd.
Surbiton Surrey, KT6 6AH England
(01) 399-3392

Product Name: Soundtracs PC MIDI Series
Contact: John Carroll, sales & marketing director

Date Product Introduced: November, 1986
Product Description & Applications: PC MIDI Series in-line console for 16-track recording and keyboard workshops. Available in two mainframe sizes, 16-input and 24-input (40- and 56-line inputs on remix) with optional effects returns for additional eight inputs.

Basic Specifications & Suggested List Price: MIDI controlled muting on all inputs and auxiliary masters, with capability to control external devices on the MIDI chain.

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* dbx is a registered trademark of the dbx Corp.

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JL COOPER ELECTRONICS

1931 Pontius Avenue • West Los Angeles, CA 90025 • (213) 473-8771 • TLX: 5100110679 JL COOPER

SOUNDTRACS PLC

77 Selleck St.
Stamford, CT 06902
(203) 348-2121

Product Name: FME Modular Mixer

Contact: Dave Talbot, national sales manager

Date Product Introduced: January, 1987

Product Description & Applications: Based on the FMX series mixer, the FME offers full modularity of inputs, outputs and groups, in 22 and 30 module mainframe sizes. Unique in the variety of module types that may be selected, the FME may be configured to suit the requirements of sound reinforcement, 4- or 8-track recording, video post-production, club and theater installations, radio production and "on air" broadcast and stage monitoring.

Basic Specifications & Suggested List Price: Module types available for the FME include mono input, mono input with remote start switch, stereo input including RIAA and line in with remote start, monitor input with 8 monitor sends, group output with upper and lower monitor sections, monitor output and stereo master module. Metering is provided via 12 LED bargraphs in an attractive display that also provides solo warning and power indicators. Pro user net prices run between \$7,500 and \$9,600 depending on configuration.

SOUNDTRACS PLC

77 Selleck St.
Stamford, CT 06902
(203) 348-2121

Product Name: "ERIC"

Contact: Derek Pilkington, director of operations

Date Product Introduced: October, 1987

Product Description & Applications: "Eric": Ergonomic Resettable Integrated Console designed to improve the productivity and flexibility of recording, video post-production, theater and film facilities. Digital routing (inc. monitors), soft muting, 32 external event controllers and fader/VCA (optional) are all controlled by an inboard 6800-based computer and with SMPTE/EBU time code. Soft muting is provided on all channels, monitors, groups, individual auxiliary sends and masters.

Basic Specifications & Suggested List Price: 32-, 40- and 48-input frames, 24 bus (individually assigned), eight auxiliaries (including one stereo, one switchable stereo), comprehensive 5-band parametric EQ, 100mm P&G faders, 60mm faders on monitor level, switched insert points, dual line inputs on monitors (computer selected), Mosses and Mitchell patchbay. All inputs, outputs and buses are balanced. Price range is \$120,000-\$200,000 depending on configuration.

SOUNDTRACS PLC

77 Selleck St.
Stamford, CT 06902
(203) 348-2121

Product Name: MRX-Series Mixer

Contact: Derek Pilkington, director of operations

Date Product Introduced: July 1, 1987

Product Description & Applications: MRX-Series mixers are designed primarily for 8- and 16-track recording and can be used in sound reinforcement applications. Three frame sizes are offered with 24, 32 or 40 inputs. Optionally the MRX may be fitted with a TT4 patchbay, (using 6-input slots), providing access to line inputs, direct outputs, insert points, groups, auxiliaries, masters, monitors and external equipment.

Basic Specifications & Suggested List Price: 8 bus, six auxiliaries, peak indicators and LED metering, individual switch phantom power, 4-band EQ, (two sweepable mid), illuminated solo, mute and tape return, 16 monitors (eight with 3-band EQ and fader reverse), and two 2-track returns. Price range is \$10,735-\$22,000 depending on configuration.



STEVEN ELECTRONICS
Steven Mixing Boards

NEW PRODUCTS**MIXING CONSOLES**

1988

STEVEN ELECTRONICS/DIV. OF LP MUSIC GROUP

160 Belmont Ave.
Garfield, NJ 07026
(201) 478-6903

Product Name: Steven Mixing Boards

Contact: George Rose, sales manager

Product Description & Applications: The Steven line of mixers and powered mixers offers a wide variety of power and input configurations. Features include: high and low impedance inputs, 3-band EQ per input, phantom power, stereo headphone out, line outs, power amp input, stereo aux input, LED peak indicators per input, LED meters/left/right/aux/monitor, onboard delay, dual 10-band graphic EQ, monitor/aux/effects/sends and returns.

STEWART ELECTRONICS INC.

PO Box 60317
Sacramento, CA 95860
(916) 635-3011

Product Name: LM-4M

Contact: James M. Ruse, national sales manager

Date Product Introduced: April 1, 1987

Product Description & Applications: The LM-4M is a 4-channel line mixer. This high impedance, rack-mountable mixer can be used to mix up to four instruments or line level sources to one controlled output. The LM-4M is the ultimate way to expand any system. For example, the LM-4M will expand one effects return bus to accept up to four effects outputs.

Basic Specifications & Suggested List Price: LM-4M features and specs include standard 1/4" phone-type input jacks, master output level control, hi or low impedance output may be obtained through use of a 1/4" connector and the unit is powered by the Stewart PS-1 24-volt external AC supply (included). The LM-4M carries a list price of \$269.



STUDER REVOX AMERICA, INC.
C279 Compact Mixer

STUDER REVOX AMERICA, INC.

1425 Elm Hill Pike
Nashville, TN 37210
(615) 254-5651

Product Name: C279 Compact Mixer

Contact: David Bowman, director of professional dealer products

Date Product Introduced: April, 1987

Product Description & Applications: The C279 is designed for basic production applications or for use as an auxiliary mixer. Six input modules accept balanced mic or line or unbalanced stereo line signals. Each input has 48V phantom power, switchable hi-pass filter, gain trim, HF and LF shelving EQ, pan/balance control, PFL switch, aux send and VCA fader. Other features include FET switching, bargraph PPM, phase metering, talkback mic, monitor speaker, headphone output and monitor level control. Options include rack mount kit and expansion unit with dbx II NR, two MM phono inputs, test generator and fader start logic.

Basic Specifications & Suggested List Price: Max. output level +24 dBv (bal.), EIN -125 dBv, THD < 0.03%. Professional user net: \$2,699.

STUDIOMASTER INC.

1340 Suite G Dynamics St.
Anaheim, CA 92806
(714) 524-2227

Product Name: Studiomastrer

Contact: Tony Allen (sales director), Paul Reeve

Date Product Introduced: June 27, 1987 (NAMM Show)

Product Description & Applications: A new range of mixing consoles for studio and sound reinforcement including Series III, a fully modular mixer expandable at both input and output, Series IV, a budget version of Series III, expandable by groups of inputs and outputs and Series V, based on the highly popular Series I but with additional features including 5 aux sends, 100mm faders, improved specifications and cosmetics as well as the Studiomastrer standard, input expandability.

Basic Specifications & Suggested List Price: Series III fully modular mixers. Example: 16 x 4 x 2 \$4,434; Series IV: 12 x 2 PA mixer, \$2,115, 12 x 2 4-channel I/P Exp. \$537; Series IV 16 x 4 x 2, \$3,300, 4-channel I/P Exp. \$600, 4 Grp. Exp. \$600; Series V 16 x 4 x 2, \$2,870, 4-channel I/P Exp. \$555; Series V 16 x 8 x 2 \$3,500, 4-channel I/P Exp. \$570.

3RD GENERATION

431 Hwy. 165
Voluntown, CT 06384
(203) 376-0433

Product Name: G162 Mixing Console

Contact: Michael Panasuk, president

Date Product Introduced: June, 1987

Product Description & Applications: The versatile G162 Stereo Mixing Console has been designed to handle the rigors of a live performance, the precise demands of home recording sessions, and the trouble-free requirements of a permanent installation. A few of the features of the new G162 include 16 mic/line inputs, 100mm Alps faders, four auxiliary sends per channel, Baxandall 3-band equalization and external power supply.

Basic Specifications & Suggested List Price: Frequency response: -3 dB points 20Hz-30kHz; distortion: less than .09% at +10 dBm; equalization: treble ± 22 dB at 12kHz, mid ± 18 dB at 350Hz, bass ± 22 dB at 50Hz; crosstalk: -55 dBm channels, -75 dBm masters; dimensions: 30.5" x 20.75" x 5.25"; weight: 38 lbs. Retail price \$1,599, with flight case \$1,850.

TLM ELECTRONICS INC.

343 Manville Rd., #6B
Pleasantville, NY 10570
(914) 769-6423

Product Name: Improved Ground Mod 1.1

Contact: Tony Marra

Date Product Introduced: January, 1987

Product Description & Applications: Improved Ground Mod 1.1 is a modification for Soundcraft 400B and Soundcraft 800B/8000 mixing consoles. TLM's Ground Mod 1.1 will lower the hum and noise floor of a new factory mixer by 3 to 6 dB. In the case of an older mixer an even greater improvement can be expected. The largest benefit is to sound reinforcement companies since the Improved Ground Mod 1.1 makes the console nearly impervious to external ground loops and buzzes.

Basic Specifications & Suggested List Price: 3 to 6 dB lower noise, 3 to 6 dB lower crosstalk. Price dependent upon frame size and module fill.

TLM ELECTRONICS INC.

343 Manville Rd., #6B
Pleasantville, NY 10570
(914) 769-6423

Product Name: Independent Routing Mod 1.4

Contact: Tony Marra

Date Product Introduced: February, 1987

Product Description & Applications: The TLM Independent Routing Mod 1.4 is a modification for Soundcraft S200B mixing consoles. It allows you to route an input channel to any one of the four output buses without having to use the pan pot. It features four selector push buttons labeled 1, 2, 3 and 4 identical in appearance to the original buttons. An optional pan switch will disable the pan pot from either the four output buses or the mix path.

Basic Specifications & Suggested List Price: Four routing switches per input channel. Optional pan enable switch, \$500 per 8 input channels.

TRIDENT AUDIO USA

2720 Monterey St., Ste. 403
Torrance, CA 90503
(213) 533-8900

Product Name: Trident 24

Contact: Wayne D. Freeman, president

Date Product Introduced: May 1, 1987

Product Description & Applications: Trident 24: Trident 24 bus multi-track recording console. Features 24 discrete bus outputs, 24 returns w/EQ, four echo returns, eight aux sends, stereo in place solo, auto muting bus. Direct outputs and insert send and returns on each channel.

Basic Specifications & Suggested List Price: 28/24 \$19,500, 28/24 w/patchbay \$24,500; 36/24 \$22,800; 36/24 w/patchbay \$28,500; 44/24 \$26,100; 52/24 \$29,400.



TRIDENT AUDIO USA
Trident 24

TRIDENT AUDIO USA
2720 Monterey St., Ste. 403
Torrance, CA 90503
(213) 533-8900

Product Name: Trident 80C Recording Console
Contact: Wayne D. Freeman, president

Product Description & Applications: Multi-track recording console specifically designed for dual multi-track mixing. Available in 32-, 40-, 48- and 56-input configurations with 48-track monitoring.

Basic Specifications & Suggested List Price: List price: 32-in \$64,950; 40-in \$82,450; 48-in \$99,950; 56-in \$117,750.



TRIDENT AUDIO USA
80C Recording Console

TRIDENT AUDIO USA
2720 Monterey St., Ste. 403
Torrance, CA 90503
(213) 533-8900

Product Name: Trident Di-An
Contact: Wayne D. Freeman, president

Product Description & Applications: Trident Di-An. Digitally controlled analog console designed for music recording applications. Totally resets itself in 20 milliseconds and available with most fader automation systems currently available.

Basic Specifications & Suggested List Price: Di-An pricing: 32 bus, 32 monitor, 40 inputs \$249,000/48 inputs \$299,000/56 inputs \$345,000. For 48 monitor, 40 inputs \$299,000/48 inputs \$345,000/ 56 inputs call.

TROIISI EDC
27 River St.
Westford, MA 01886
(617) 692-7768

Product Name: FCA 900

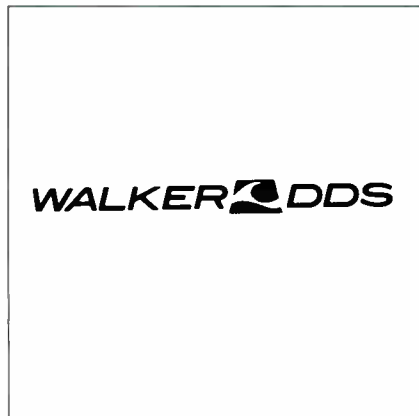
Contact: Stewart Adam, VP marketing & sales

Date Product Introduced: August/September, 1987

Product Description & Applications: The Troisi FCA 900 is a modular audio console designed to fit a wide variety of applications. Each I/O strip is composed of sub modules, which may contain parametric equalization, compression/expansion, echo send, mic preamp and bus assign modules. It may be configured in any size from an 8 x 2 console with an optional dolly to a 48 x 24 main frame. VCA automation and video editor interface are available.

Basic Specifications & Suggested List Price: Microphone

noise is better than -129.5 (20-20k) when sourced to 50 ohms, line input noise is better than -85. Frequency response is +5 to -5 dB (20-20k). Total harmonic distortion is .01%, multi-track crosstalk is less than -70 dB.



WALKER/DDS

WALKER/DDS
Cluster Master™ Module

WALKER/DDS
6850 35th NE, Ste. 1
Seattle, WA 98115
(206) 527-4371

Product Name: Cluster Master™ Module
Contact: Bob Rice

Date Product Introduced: October, 1987

Product Description & Applications: Walker/DDS introduces a powerful tool for live sound reinforcement. The 3-way master output module directly addresses the trend toward using a main central cluster with two side-fill clusters. The Cluster Master™ Module is double-width and includes eight pan receive pots, each with a 2-way/3-way switch, corresponding to the eight subgroup outputs. Each subgroup can thus be panned in 2-way left-right, or in 3-way left-center-right mode at the touch of a button.

Basic Specifications & Suggested List Price: The module employs three 10-segment LED strings at the top. A monoaural summed output is provided on the rear panel, which is ideal for use with balcony or delay clusters. This module is compatible with the regular matrix functions of the Walker/DDS line of mixers, and can be retrofitted into all existing Walker-built consoles.

WHEATSTONE CORPORATION
6720 V.I.P. Pkwy.
Syracuse, NY 13211
(315) 455-7740

Product Name: SP-6 Stereo Production Console

Contact: Gary Snow, president

Date Product Introduced: April, 1987

Product Description & Applications: A full-featured production board available in 4- or 8-track configurations. Includes stereo and mono input modules with machine control, remote on/off capabilities, control room and studio muting and full multi-track monitoring. The tally logic system enables full on-air operation. Also featured are four auxiliary send buses, clocks, timers, tape remote controls and equalizer and effects send capabilities on each channel.

Basic Specifications & Suggested List Price: The SP-6 is configured to a client's specifications from four to 56-input channels. Pricing is based on client's specifications. Please contact Wheatstone Corporation for specific pricing quotes.

YAMAHA INTERNATIONAL CORPORATION
PO Box 6600
Buena Park, CA 90622
(714) 522-9011

Product Name: MC-Series Consoles
Contact: Professional Audio Division

Date Product Introduced: June, 1987

Product Description & Applications: The MC-Series of professional sound reinforcement consoles consist of the MC802, MC1202 and MC1602. All models feature electronically balanced inputs with both Hi-Z phone jacks and Lo-Z XLRs; 20dB pad; channel insert jacks; 3-band EQ and three independent aux sends on each channel; cue listening of pre-fader, aux, or stereo mix via headphone output; three illuminated VU meters; talkback mic input and 48-volt phantom power.

Basic Specifications & Suggested List Price: The MC-Series stereo professional mixing consoles carry the following suggested retail prices: \$845, MC802; \$1,095, MC1202; and \$1,295, MC1602.



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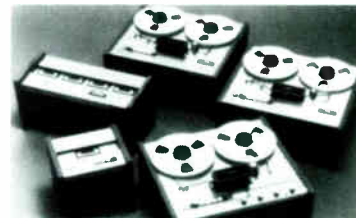
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2302 E. Michigan Blvd., P.O. Box 1111,
Michigan City, IN 46360

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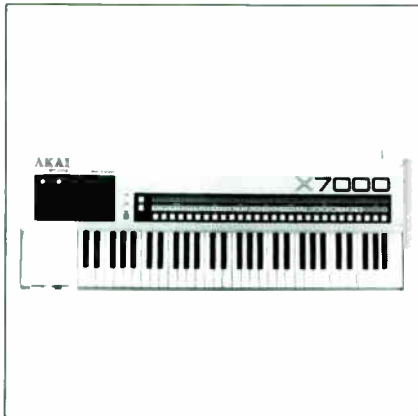
1988

THE AIRCRAFT DIGITAL PRODUCTION MUSIC LIBRARY
77 N. Washington St.
Boston, MA 02114
(800) 343-2514
(617) 367-0510

Product Name: The Aircraft Digital Production Music Library
Contact: Mark Cuddy, president
Date Product Introduced: August, 1987

Product Description & Applications: The Aircraft Music Library is now available on compact disc. Not only are these albums available, but also, each existing album has been extended for CD to include more selections per album. In addition, many more production elements have been added for greater flexibility. Aircraft Production Music is considered by many to be the most innovative production library in years. A speed search system is included as part of this digital production package.

Basic Specifications & Suggested List Price: 20 compact discs with catalog in a "Great Guy!" storage case



AKAI PROFESSIONAL
X7000 Digital Sampling Keyboard

AKAI PROFESSIONAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

Product Name: X7000 Digital Sampling Keyboard
Contact: Mike McRoberts, director

Date Product Introduced: December, 1986

Product Description & Applications: The X7000 is a multi-point digital sampling keyboard. It holds 16 samples at a time, with each sample between .8 seconds and 8 seconds in length. Samples are grouped into any of 32 program banks. Information is stored on 2.8" Quick Disks for fast access. Sampling is very easy to do on the X7000 thanks to its logical design. An "autoloop" circuit makes looping quick and easy.

Basic Specifications & Suggested List Price: 4kHz to 40kHz sampling rate, 12-bit resolution, 8-8 seconds sampling time per sample, overdub feature, low pass filter; LFO; velocity control; 16 samples; 32 programs; 61-note keyboard; 16-character LCD display, optional voice-out cable. \$1,399.95.

AKAI PROFESSIONAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

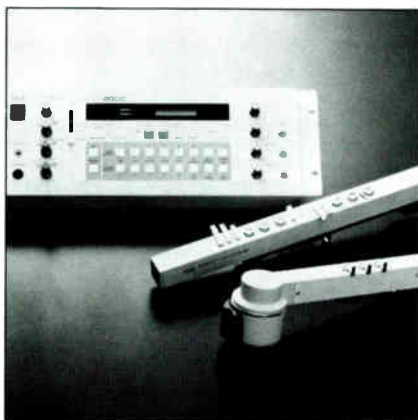
Product Name: Akai-Linn ADR 15
Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The ADR 15 is a professional quality digital sampling drum machine and full-featured MIDI sequencer. The drum machine has 16 large velocity and

pressure sensitive pads for entering drum data. A large screen can display a full paragraph of "help" information for each function. The sequencer can record up to 99 sequences, each 99 tracks deep. Sequences can be time shifted and transposed. The ADR 15 is a complete MIDI studio production machine.

Basic Specifications & Suggested List Price: Sampler: 12-bit enhanced resolution, 40kHz sampling rate, up to 26 seconds sampling time, 16-voice, 11 outputs; sequencer: 60,000 notes, 99 sequences, 99 tracks, 20 songs; MIDI, SMPTE and FSK sync; 96 pulse per quarter note clock, 320 character LCD display; 4 MIDI outputs and 2 MIDI inputs. \$4,995.95.



AKAI PROFESSIONAL
EWI 1000/EWV2000 Electronic Wind Instruments

AKAI PROFESSIONAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

Product Name: EW1000/EWV2000 Electronic Wind Instrument

Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The EW1000 Electronic Wind Instrument is a MIDI Woodwind Controller with sax-like fingerings. The EW1000 allows sax players to control MIDI instruments with all the expressive dynamics that they can achieve with their acoustic instruments. The EWV2000 is a MIDI sound module that accompanies the EW1000. It has 2 parallel synthesizer circuits, and responds to breath and lip control from the EW1000.

Basic Specifications & Suggested List Price: EW1000: 13 keys, 7-octave range, lip and breath sensor, touch sensitive keys, octave roller, EWV2000: 2 VCOs, 3 filters, 2 envelope generators, 2 VCAs, external input for processing other instruments, 64 programs, MIDI out, 16 character LCD display. \$1,999.95

AKAI PROFESSIONAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

Product Name: S700 Digital Sampler

Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The S700 is a rack-mountable digital sampler. It can hold 16 separate samples, each from .8 seconds to 8 seconds in length. Samples are grouped into any of 32 programs. All data is stored on 2.8" Quick Disks for fast access. With its compact size and crystal clear sound quality, the S700 is ideal as a drum-sound source for sequencers and recording studios, and for any high quality sampling purposes.

Basic Specifications & Suggested List Price: 4kHz-40kHz sampling rate, 12-bit resolution; .8-8 seconds sampling time per sample; 16 samples; 32 programs, low pass filter; LFO; auto loop and manual looping; overdub feature; 16-character LCD display, optional voice out cable. \$999.95

AKAI PROFESSIONAL

PO Box 2344

Fort Worth, TX 76113

(817) 336-5114

Product Name: Akai-Linn ASQ10

Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The ASQ10 is a professional MIDI sequencer designed to operate as the control center of a MIDI production studio. Its ease of operation is enhanced by the use of a "help" button that displays a full paragraph of information on each function. It has an extremely large memory capacity. It is designed to sync up to all forms of sync currently used, including SMPTE and MIDI time code.

Basic Specifications & Suggested List Price: 60,000 note; 99 sequences, 99 tracks, 20 songs, 4 MIDI outs and 2 MIDI ins; 96-pulse per quarter note clock; sync-MIDI clock, FSK, MIDI and SMPTE time code, metronome; 256 steps per song; 2 sequences may play simultaneously. \$2,499.95

AKAI PROFESSIONAL

PO Box 2344

Fort Worth, TX 76113

(817) 336-5114

Product Name: EVI1000/EWV2000 Electronic Valve Instrument

Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The EVI1000 Electronic Valve Instrument is a MIDI wind controller with standard trumpet fingerings. The EVI1000 allows brass players to control MIDI instruments with all the same expressiveness of their acoustic instrument. The EWV2000 is a MIDI sound module that accompanies the EVI1000. It has 2 parallel synthesizer circuits, and responds to breath and lip control from the EVI1000.

Basic Specifications & Suggested List Price: EVI1000: 3 valve keys, 3 trill keys, 7 octave range, lip and breath sensor, touch-sensitive keys, vibrato control lever, octave roller, EWV2000: 2 VCOs, 3 filters, 2 envelope generators, 2 VCAs, external input for processing other instruments, 64 programs, MIDI out, 16-character LCD display. \$1,999.95

ALESIS CORPORATION

7336 Hinds Ave.

North Hollywood, CA 91605

(213) 467-8000

Product Name: HR-16 High Sample Rate Digital Drum Machine

Contact: Allen Wald, vice president, marketing

Date Product Introduced: June, 1987

Product Description & Applications: The HR-16 High Sample Rate Digital Drum Machine features 16-bit drum samples and a 18-bit processing system. The 48 drum and percussion samples represent a new level of clarity, detail and technical purity. Sounds range from pure acoustic tonalities to aggressive power drums and electronic drums. Because of its breakthrough technology and unprecedented price/performance ratio, the HR-16's applications easily span the full range from quality record production to home studio demos and live performance.

Basic Specifications & Suggested List Price: 16 channels, 16-bit, 48 samples, 47kHz sample rate, 20kHz bandwidth, 100 patterns, 100 songs, full MIDI implementation, song position pointer. Assign any sound to any MIDI note. Assign any sound to any drum pad. Programmable volume, pan and pitch. Programmable sound selection per drum pad, per pattern. Velocity sensitive drum pads. Tape sync. Single step editing. Real time record. Outputs: two stereo pairs/fully assignable. Start/stop foot pedal jack. Price \$499.

ALESIS CORPORATION

7336 Hinds Ave.

North Hollywood, CA 91605

(213) 467-8000

Product Name: MMT-8 Multi-Track MIDI Recorder

Contact: Allen Wald, vice president, marketing

Date Product Introduced: June, 1987

Product Description & Applications: The MMT-8 Multi-Track MIDI Recorder is designed to be the most user-friendly MIDI recorder ever made. Its 8-track buttons, record, play, fast forward and rewind buttons allow immediate recognition as a standard multi-track recording environment. In spite of its user-friendliness, the MMT-8 supports full MIDI implementation. As such, its applications span the range from home recording enthusiast to the fully professional MIDI recording studio.

Basic Specifications & Suggested List Price: 8 tracks, 100 parts, 100 songs, 8 tracks per part. Each track can contain all 16 MIDI channels. Merge, unmerge, records system exclusive information, single-step editing, song position pointer, tape sync, battery backup, MIDI In, MIDI Out, MIDI Thru, sequence looping, fast forward and rewind. Price \$299.

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156 WEST 48th STREET
NYC, NY 10036
212 819-0576

AMR (AUDIO MEDIA RESEARCH)

PO Box 1230
Meridian, MS 39301
(601) 483-5372

Product Name: MIDI Manager

Contact: Ken Valentine, product manager

Date Product Introduced: June, 1987

Product Description & Applications: The AMR MIDI Manager allows total pre-programmed MIDI system control for the studio or on-stage. Commands received at the single MIDI-in jack may be forwarded to any of the four MIDI-outs, either as received or modified as programmed. Eight programmable logic output lines are also provided via a DB-9 rear panel connector. Any of these eight logic outputs may be pre-programmed to be high (on) or low (off) dependent on the command received at the MIDI-in jack. These logic lines allow control of non-MIDI equipment.

Basic Specifications & Suggested List Price: One MIDI in and four MIDI outs. Programmable in standard MIDI or hexadecimal code. 40-character x 2 line, back-lit LED window for parameter display. Single 19" rack space package. Suggested U.S. price list: \$399.50.

ASSOCIATED PRODUCTION MUSIC

888 7th Ave.
New York, NY 10106
(212) 977-5680

Product Name: Original Music by Richard Honoroff

Contact: Jerry Burnham, E. Coast sales mgr.

Date Product Introduced: June, 1987

Product Description & Applications: Richard Honoroff in association with APM has just formed the APM Original Music Division. Mr. Honoroff's credits include the NBC Olympic logo, the theme for the NBC News Show 1986, Superbowl XX, NFL '86 and NBC World Cup Soccer. We can now offer original music for station IDs, news, sports themes, program themes, etc.

Basic Specifications & Suggested List Price: Prices to be negotiated

ASSOCIATED PRODUCTION MUSIC

888 7th Ave.
New York, NY 10106
(212) 977-5680

Product Name: "Broadcast One"

Contact: Jerry Burnham, E. Coast sales mgr.

Date Product Introduced: June, 1987

Product Description & Applications: Broadcast One is a package of ten compact discs especially designed for use in broadcast promotions and programming. The package contains over 100 different pieces in full length, 60- and 30-second versions. All cuts are from the KPM and Bruton music libraries.

Basic Specifications & Suggested List Price: Unlimited use of any music from 10 CDs for only \$1.50 a year. Additional CDs \$50 each. No reporting. Easy to use.

BOSENDORFER PIANOS OF VIENNA/**KIMBALL INTERNATIONAL**

1600 Royal St.
Jasper, IN 47546
(800) 482-1616

Product Name: Bosendorfer 275SE and 225SE

Contact: Hal Vincent, musical engineering manager

Date Product Introduced: June 27, 1987

Product Description & Applications: Two additional Bosendorfers, the 9' concert grand and 7'4" grand are now available with the computer-based piano performance reproduction system. This system interfaced to any IBM PC, will store and replay anything performed on the piano, actually operating the keys and pedals to precisely duplicate the original performance. Already used in sessions, studios have saved hours of production time in piano recording. Performances can be edited from the computer prior to the recording session.

Basic Specifications & Suggested List Price: Both models include: 92-note keyboard, genuine ivory and ebony keys, 184 optical sensors and related electronics, playback mechanism with 92 solenoids and 23 drive boards, control box, modified cassette deck, IBM serial interface, all necessary cables and connectors, program software. IBM PC is optional.

COMPLETE SAMPLE LIBRARY

1616 Vista Del Mar Ave.
Los Angeles, CA 90028
(213) 463-6191

Product Name: Percussion & Effects: Volume 1/Percussion; Volume 2 (Orchestral)/Electronic Sounds: Volume 1 (Synthesizer combinations)

Contact: William A. Jackson

Date Product Introduced: Summer 1987

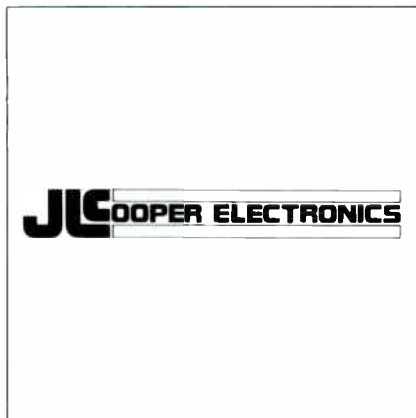
Product Description & Applications: Digitally mastered compact disc which produces pure analog sounds. Each band contains many sounds for each instrument. Each sound is slated with a corresponding number in the booklet provided, and repeated twice in succession. If you locate a specific sound in the booklet, you simply go to the band number listed for that instrument, and scan for the slated number, and the

NEW PRODUCTS**MUSIC PRODUCTS**

1988

corresponding sound will be located.

Basic Specifications & Suggested List Price: Digitally master sound on compact discs, to be used with any compact disc player. List price: \$49.95 (U.S.)

**JL COOPER ELECTRONICS****PPS-1 (Poor Peoples SMPTE-1)**

JL COOPER ELECTRONICS

1931 Pontius Ave.
Los Angeles, CA 90025
(213) 473-8771

Product Name: PPS-1 (Poor Peoples SMPTE-1)

Contact: A. Khan, sales manager

Date Product Introduced: June, 1987 summer NAMM

Product Description & Applications: MIDI sync-to-tape sync box with Song Position Pointer. Syncs virtual tracks from a MIDI sequencer/drum machine with multi-track recorders. Tape chase and lock feature, like SMPTE. Allows merging of incoming MIDI data with clock (sync) information. Hidden feature of MIDI time code to SMPTE sync box when used with specific film scoring software packages.

Basic Specifications & Suggested List Price: 1 MIDI input, 2 MIDI outputs, 1/4" audio in and 1/4" audio out. LED to show lock status. \$199.50.

DAUZ DESIGNS

4715 W. El Segundo Blvd., #B
Hawthorne, CA 90250
(213) 219-0033

Product Name: Daut Drum Pads

Contact: Dan Daut, president

Date Product Introduced: June, 1987

Product Description & Applications: Daut Drums are electronic drum pads featuring 6" soft playing surface for excellent response and feel. Pad includes a unique spring-loaded shock mount, eliminating false triggering from external vibrations from adjacent pads. Back of pad is detachable to allow user modifications.

Basic Specifications & Suggested List Price: 1/4" trigger output and adjustable mounting clamp to fit any hardware from 7/16" to 1/2". Retail price: \$89.95. For dealer info., call Michael Wren, Sales (714) 921-9325.

DDRUM

1201 US 1
North Palm Beach, FL 33408
(305) 622-0000

Product Name: ddrum plus

Contact: Magnus Ahlen, president

Date Product Introduced: March 15, 1987

Product Description & Applications: Digital percussion that provides studio quality sounds whether live or in a studio. Easy to operate. Outstanding sound quality, choose your percussion brand, we have them all. The ddrum system is a musician's choice, extremely roadworthy, which makes it a superb choice for touring groups.

Basic Specifications & Suggested List Price: 19" rack format, 4-unit high, built-in mixer with headphone amplifier, large sound library, separate mix out and headphones levels, line in (for click track, music, etc.). ddrum pads are like playing real drums in respect to both feel and dynamics. Real drumheads and hoops makes the drummer feel at home. \$3,250.

DE WOLFE MUSIC LIBRARY

25 W. 45th St.
New York, NY 10036
(212) 382-0220

Product Name: De Wolfe Music Library

Contact: Mitchel Greenspan, vice president

Date Product Introduced: Updated 1987

Product Description & Applications: Music Library on compact disc.

Basic Specifications & Suggested List Price: All information provided upon request.

DIGITAL MUSIC CORP.

21787 Ventura Blvd., Ste. 124
Woodland Hills, CA 91364
(818) 704-7879

Product Name: MX-8 MIDI Patchbay/Processor

Contact: Gene Barkin, customer service mgr.

Date Product Introduced: January 1, 1987

Product Description & Applications: The MX-8 MIDI Patchbay/Processor routes six inputs to eight outputs and stores 50 configurations. Numerous features include: MIDI delay, filters, keyboard mapping, patch chain, transpose and merge. Optional software allows control from most computers.

Basic Specifications & Suggested List Price: \$395

E-MU SYSTEMS

1600 Green Hills Rd.
Scotts Valley, CA 95066
(408) 438-1921

FAX: (408) 438-8612

Product Name: Emulator III Digital Sound Production System

Contact: Suz Howells, advertising & promo mgr.

Date Product Introduced: Chicago NAMM

Product Description & Applications: Designed to be a musical instrument, an audio post-production workstation and a digital effects processor in one system. Features stereo sampling, 16 voices, 16-bit linear data format (30kHz and 44.1 kHz sample rates). Output channels feature phase-linear digital oversampling filters. System expansion options include an E3 expander which provides 32 channels and 16 Mbytes of RAM, Macintosh II digital audio workstation developed in conjunction with Digidesign.

Basic Specifications & Suggested List Price: Up to 8 Mbytes internal RAM, up to 135 seconds sampling time. 40 Mbyte internal hard disk drive standard. Three envelope generators and one multi-wave LFO per channel. Advanced sequencer with cut and paste, SMPTE cue list sequencing. SCSI interface. Keyboard and rack mount versions available.

E-MU SYSTEMS

1600 Green Hills Rd.
Scotts Valley, CA 95066
(408) 438-1921

FAX: (408) 438-8612

Product Name: SP-1200 Sampling Percussion System

Contact: Suz Howells, advertising & promo mgr.

Date Product Introduced: Chicago NAMM

Product Description & Applications: Sampling Percussion System 12-bit linear sampling, internal 3.5" floppy disk drive, ten seconds internal RAM at 27k sample rate. Comes standard with 120 sounds.

Basic Specifications & Suggested List Price: Eight velocity sensitive play buttons, eight channel outputs, eight fader controls, programmable tunings/decays/levels/tempo changes, truncation and looping controls backwards mode, segment editing and redimensioning SMPTE read/write, MIDI song pointer, MIDI sample dump.

E-MU SYSTEMS

1600 Green Hills Rd.
Scotts Valley, CA 95066
(408) 438-1921

FAX: (408) 438-8612

Product Name: Emax HD Digital Sampling System

Contact: Suz Howells, advertising & promo mgr.

Date Product Introduced: Chicago NAMM

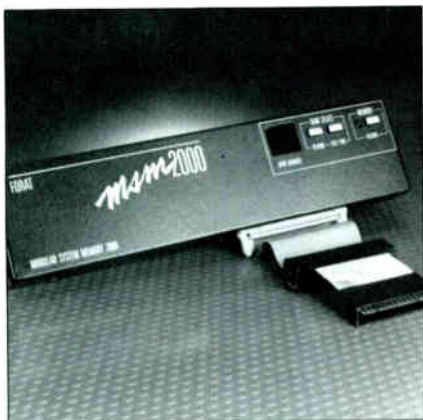
Product Description & Applications: Digital Sampling System with 20 Mbyte internal hard disk drive and 3.5" floppy disk drive. Four second load time, 36 banks of 500 Kbytes sample memory (18.8 sec. at 28k sample rate—8 rates from 10k-42k, equivalent 12-bit linear resolution). Comes standard with 30 banks of sounds.

Basic Specifications & Suggested List Price: Truncation, crossfade looping, splicing, backwards mode, eight VCFs, eight VCAs (16) 5-stage envelope generators, eight LFOs, chorus, eight channels two samples per channel, programmable panning, 61 velocity sensitive keys, 122 samples per preset, dual stacking mode, sequencer, arpeggiator, RS 422, eight separate outputs plus L-R stereo. Keyboard and rack versions available.

FIRSTCOM BROADCAST SERVICES

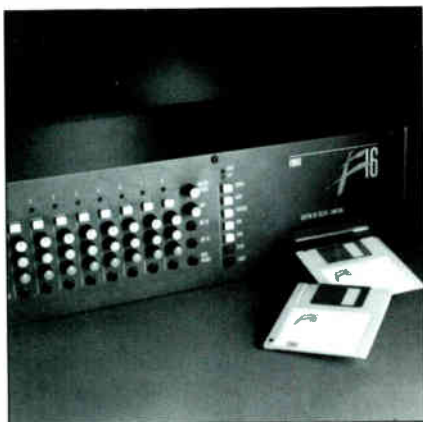
13747 Montfort Dr., Ste. 220
Dallas, TX 75240
(214) 934-2222

Product Name: FirstCom/Music House Library
 Contact: Cecelia M. Garr, executive vice president/general manager
 Date Product Introduced: 1986/1987
 Product Description & Applications: FirstCom's Digital Production Library has joined forces with Music House of London to bring you 50 CDs of brand new music in 1987; the equal of 100 LPs of music! FirstCom's Digital brings you all brand new, totally contemporary music. Tremendous variety of superstar writers give your commercial, multi-image and film production an enormous diversity of new sounds. Over 1,500 tracks, all originally recorded and mastered for compact disc. Music House Library features, in production in the U.K. for a year, sounds and styles ranging from solos to 75-piece orchestras. Produced by Robin Phillips, former managing director of the KPM and Bruton Libraries
 Basic Specifications & Suggested List Price: Choice of 25 CDs licensed on an annual fee or take advantage of a flexible track fee program depending on your specific circumstances.



FORAT
MSM-2000

FORAT
 11514 Ventura Blvd.
 Studio City, CA 91604
 (818) 763-3007
 Product Name: MSM-2000
 Contact: Toby Sali, marketing
 Date Product Introduced: 1987
 Product Description & Applications: The MSM-2000 Modular System Memory offers you the ability to store over 2,000 custom sounds, including the 512 free sounds we give you, for your Yamaha DX7, RX11 or Roland keyboards. All at the push of a button. Like your tape machine, the MSM 2000 has three buttons: Fast Forward, Rewind and Record. The first two allow you to step or scroll through 64 banks of 32 sounds each. To save a sound, push the Record button. Once activated, you can save to or format the bank shown in the display window.
 Basic Specifications & Suggested List Price: Rechargeable batteries provide automatic memory protection. Price with Yamaha or Roland RAM cartridge interface, \$595. Additional interfaces are \$95 each, as is an optional footswitch control. One-year parts and labor warranty.



FORAT
F-16

FORAT
 11514 Ventura Blvd.
 Studio City, CA 91604

(818) 763-3007
 Product Name: F-16
 Contact: Toby Sali, marketing
 Date Product Introduced: July 1, 1987
 Product Description & Applications: The F-16 is a full 16-bit digital sampler x eight channels or optional 16 channels with a bandwidth 10kHz to 50kHz. Each channel will store six to 26 sec. of information or link eight channels together to get 3.5 min. mic and line inputs plus MIDI In, Out and Thru. Trigger from tape levels or acoustic pads.
 Basic Specifications & Suggested List Price: \$5,995 with eight channels, \$2,495 with one channel.

GARFIELD ELECTRONICS
 Box 1941
 Burbank, CA 91507
 (818) 989-6021
 Product Name: Time Commander
 Contact: Dan Garfield, president
 Date Product Introduced: June 27, 1987
 Product Description & Applications: Synchronizes sequencers and drum machines to live input such as a drummer's kick and snare, or to a MIDI keyboard, guitar or drum set. Also syncs to 24 or 48 ppqn clocks, Oberheim, Roland, Yamaha or Linn LM-1 FSK sync codes, MIDI clocks and steady or varying click tracks. A SMPTE/MIDI time code option generates and synchronizes to SMPTE and MTC locating sequencers and drum machines to tape position through MIDI with conversion from SMPTE to MTC provided as well.
 Basic Specifications & Suggested List Price: Outputs 24, 48, 96 and 384 ppqn clocks, Roland and Korg DIN syncs, MIDI, metronome click and start/stop. Features zero to eight beat adjustable count in or manual cueing, on-beat punch in/punch out, internal metronome and play modes, alternate timebase operation and real time compensation of sequencer and drum machine response times. SMPTE/MTC functions in 25 FPS and 30 NDF. Standard model \$750, SMPTE/MTC option \$150.

HARMONICA MUSIC PUBLISHING CO.
 2160 Monterey Blvd.
 Hermosa Beach, CA 90254
 (213) 372-8727
 Product Name: How to Play Harmonica Instantly-The Video Vol. I & II
 Contact: Marcos
 Date Product Introduced: 1986

Product Description & Applications: Marcos, a 1984 Hohner Artist Calendar endorsee and professional session player for 15 years, has prepared this method to make learning to play the harmonica as easy as possible. The video follows the highly acclaimed book and cassette package distributed by Hohner and Warners. Vol. I is for the beginner who has never played music. Vol. II is for the player who wants to learn how to bend blues notes.
 Basic Specifications & Suggested List Price: Each video is a half-hour long. Suggested retail prices (excluding shipping & handling) are \$34.95 with Hohner harmonica, or \$29.95 without harmonica.

HARMONY SYSTEMS, INC.
 3672 Howell Wood Trail
 Duluth, GA 30136
 (404) 662-8788
 Product Name: SynHance FZRAM
 Contact: Douglas R. Kraul, president
 Date Product Introduced: July, 1987
 Product Description & Applications: The SynHance FZRAM provides sample memory expansion for the Casio FZ1 sampling memory, increasing the full bandwidth sampling time to 29 seconds of 16-bit samples. The SynHance FZRAM mounts internal to the FZ1 using the standard Casio expansion port. No modifications required.
 Basic Specifications & Suggested List Price: 1 MegaByte of high-speed sample memory organized as 512 X 16 sample words. Expands FZ1 sample times to 29 sec at 36k samples/sec., 58 sec at 18k samples/sec., and 116 sec at 9k samples/sec. Internally mounted within FZ1 using built-in expansion slot. Suggested retail: \$249

HEIL LTD.
 #2 Heil Dr.
 Marissa, IL 62257
 (618) 295-3000
 Product Name: Talk Box
 Contact: Bob Heil
 Date Product Introduced: March, 1987
 Product Description & Applications: An electro-mechanical device for special "talking effects" with electric guitarist. The Heil Talk Box is used by top groups such as Bon Jovi, Peter Frampton and Joe Walsh.
 Basic Specifications & Suggested List Price: \$199.95 100-watt RMS power rating. Phone jack input and outputs

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NEW PRODUCTS

**MUSIC
PRODUCTS**

1988

HI-TECH MUSICAL SERVICES

2800 S. Washington Blvd.
Marina Del Rey, CA 90292
(213) 822-1983

Product Name: Mini-Moog MIDI-ready
Contact: Tim Myer, manager

Date Product Introduced: November, 1986

Product Description & Applications: The "MIDI-Ready" is an extensive MIDI mod to the Minimoog supporting keyboard CV and gate, velocity, pitch bend, modulation and aftertouch. The mod adds a bend range control, CV out-jack, switch selectability of all mod features, and calibration to 1-volt per octave. Designed to interface with the Roland MPU-101. Unbeatable Minimoog bass and lead sounds controllable thru MIDI.

Basic Specifications & Suggested List Price: \$450 plus the Roland MPU-101

J.T. ENTERPRISES

6924 W. Arrowhead
Kennewick, WA 99336
(509) 735-7430

Product Name: Drumbug "Speedball Ratchet Drumkey"[™]
Contact: Steve Hickman, pres.

Date Product Introduced: January, 1987

Product Description & Applications: Drumbug "Speed Ball Ratchet Drumkey"[™] is a 1 1/4" ball ratchet, almost the size of a golf ball, with a hardened steel shaft key that fits either end of the ball to reverse the ratchet either way. Takes off drum heads faster than a conventional key and gives more torque for tightening.

Basic Specifications & Suggested List Price: Ball 100% polycarbonate, 150-in/lbs of torque, (U.S. testing lab reports) tested 1 million cycles, shaft: hardened steel, nickel chrome plated, U.S. patent #3,742,787, sockets, screwdriver bits available turn it into a tool kit. Suggested retail \$8.99 U.S.

KAT

43 Meadow Rd.
Longmeadow, MA 01066
(413) 567-1395

Product Name: KAT MIDI Percussion Controller

Contact: Bill Katoski, president

Date Product Introduced: upgraded December, 1986

Product Description & Applications: The KAT MIDI Percussion Controller is velocity sensitive, fully polyphonic and has a vibs-like layout. It provides a powerful, flexible means for drummers/percussionists to play in the world of MIDI. It's modular from 1 to 4 octaves and has rubber playing pads with a practice pad feel for player comfort and to limit the impact noise. The KAT makes no sound itself, it provides a natural means to control any other MIDI instrument.

Basic Specifications & Suggested List Price: 256 independent MIDI setups. Each setup has a split-point, and left and right values of: MIDI channels, pitch ranges, minimum and maximum velocity, velocity curves, hold times, preset changes and effects device controls, footswitch assignments and MIDI note reassignments. Master Octave is \$1,095, Expander Octaves are \$595 list.

KEYBOARD TECHNOLOGIES

666B W. Union Ave.
Montebello, CA 90640
(213) 725-6972

Product Name: KTI GZ-1000 Performance Keyboard

Contact: Tony N. Todaro, director of marketing, sales

Date Product Introduced: October, 1987

Product Description & Applications: GZ is a new approach, the world's first true percussive and adjustable piano action. Dedicated to every keyboard player's hands and modern musician's needs. Everything from true action adjustments to data entry and programming may be accomplished thru the keyboard itself. GZ-1000 is perfect for every recording studio for MIDI control of every keyboard. Engineered by KTI and manufactured in America by Baldwin. Weight is only 55 pounds!

Basic Specifications & Suggested List Price: 88 individual hammer adjustments allow players to personalize action. Powerful, open-ended MIDI computer manages system. 1.2 Mb disk drive with advanced MIDI implementation. First multiple, software controlled MIDI input/output rear panel with 8 MIDI Out/Thru ports, 2 MIDI In (merge), plus assignable footswitches and footpedals. Manufacturer's suggested retail price: \$2,945.

KEYBOARD TECHNOLOGIES

666B W. Union Ave.
Montebello, CA 90640
(213) 725-6972

Product Name: KTI GZ-D Drives & Performance Software

Contact: Tony N. Todaro, director of marketing, sales

Date Product Introduced: October, 1987

Product Description & Applications: 1.2 Mb disk drives for advanced MIDI implementation for system exclusive sound data dump and saves. Use with GZ-1000 or GZ-500 Performance Keyboards. The GZ is capable of storing thousands of physical key-on, key-off positions, a new MIDI performance parameter. Additional MIDI control setups may be "downloaded" from any keyboard, reworked and saved to disk, which is especially valuable to recording studio players. Very user friendly.

Basic Specifications & Suggested List Price: GZ-D is a single drive, GZ-DII are two drives. 1.2 Mb each, they may be combined for keyboard top or 19" rack mount (with adapter) installation. 3 1/2" disks are available for all popular synthesizer and rack systems, including Roland, Yamaha and Ensoniq. Performance software and sounds are updated periodically to provide the latest combinations for every recording studio and performance keyboardist.

KMD SOUND ELECTRONICS

PO Box 507
Bloomfield, CT 06002
(203) 243-7888

Product Name: XV100SD Guitar Amp

Contact: Bud Mayer, elec. prod mgr

Date Product Introduced: July 1, 1987

Product Description & Applications: 100-watt all-valve guitar amplifier specifically designed to meet the requirements of serious professional electric guitarists, like KMD endorsee Riche Sanborn of Bon Jovi. The XV100SD head is made in England and offers the classic English heavy rock sound sought after by professionals worldwide.

Basic Specifications & Suggested List Price: 2-channel switching with overdrive boost; independent tone and reverb controls, line-out with adjustable level control, 2 separate patch points for effects looping; hi/lo sensitivity inputs, 100+ watts output. Suggested list \$1,199.50

KORG U.S.A. INC.

89 Frost St.
Westbury, NY 11590
(516) 333-9100

Product Name: DSM-1 Digital Sampling Module

Contact: Kim Holland, VP product development

Product Description & Applications: A 16-voice multi-timbral sampling module with built-in synthesizer capabilities and separate outputs. Features 1 meg (million words) of 12-bit sample memory. Memory storage up to 32 different multi-sounds, each comprised of 16 individual samples or waveforms, and quad density 2 meg 3" disk with fast save and load time. Advanced sampling functions, sample editing and waveform creation capabilities are included such as reverse, link, mix, truncate, view and edit plus back-and-forth and linear and "equal power" crossfade looping. Harmonic synthesis mode.

Basic Specifications & Suggested List Price: 16-voice with 16 digital oscillators, 16 VCFs, 16 VCAs, 32 six-parameter envelope generators, split and layer, 16 separate outputs, composite mix output, DSS-1 library compatible to access thousands of samples and programs.



KURZWEIL MUSIC SYSTEMS, INC.
Kurzwel 1000 Series

KURZWEIL MUSIC SYSTEMS, INC.

411 Waverley Oaks Rd.
Waltham, MA 02154
(617) 893-5900

Product Name: Kurzweil 1000 Series
Contact: Sales and Marketing Dept.
Date Product Introduced: June 27, 1987
Product Description & Applications: The Kurzweil 1000 Series makes available Kurzweil 250-quality sounds in four rack-mountable, 2-space modules known as the 1000 PX ("Professional Expander"), the 1000 SX ("String Expander"), the 1000 HX ("Horn Expander") and the 1000 GX ("Guitar Expander"). These programmable, multi-timbral sound sources are designed as an addition to any MIDI setup, providing the user with Kurzweil 250 quality sounds in rack mount modules with extensive programmability and a minimum of 20 channels.
Basic Specifications & Suggested List Price: The Kurzweil 1000 PX and 1000 GX retail for \$2,495. The 1000 HX and SX retail for \$1,995. 128 presets and up to 64 user-defined programs per module; full MIDI implementation, including multi-timbral capabilities over MIDI, extensive effects editing; numerous preset effects. The 1000 PX features 24 channels; the GX, PX and HX offer 20. Three operating modes: Play, Compiled Effects Editing and Modular Effects Editing. Stereo out, pedal in.

KURZWEIL MUSIC SYSTEMS, INC.
 411 Waverley Oaks Rd.
 Waltham, MA 02154
 (617) 893-5900
Product Name: K1000
Contact: Sales and Marketing Dept.
Date Product Introduced: June 27, 1987
Product Description & Applications: The K1000 is a keyboard version of the Kurzweil 1000 PX ("Professional Expander"). It is a portable, programmable keyboard instrument that provides Kurzweil 250 quality sounds, such as grand piano, string section, choir, Hammond B-3 organ, trumpet, acoustic bass, baritone horn, vibes, clarinet and 11 digital waveforms. The K1000 also features extensive programmability and 24 channels. It can be used as a performance instrument or as a master MIDI controller.
Basic Specifications & Suggested List Price: Suggested list price \$2,495. 128 presets and up to 64 user-defined programs, full MIDI implementation, including multi-timbral capabilities over MIDI, extensive effects editing; numerous preset effects, 24 channels. Three operating modes: Play, Compiled Effects Editing and Modular Effects Editing. 76 weighted plastic keys, pitch and mod wheels, stereo out, pedal in.

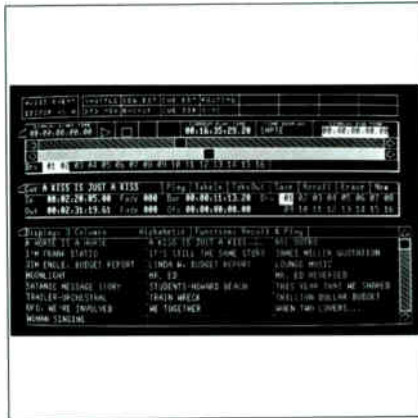
KURZWEIL MUSIC SYSTEMS, INC.
 411 Waverley Oaks Rd.
 Waltham, MA 02154
 (617) 893-5900
Product Name: Kurzweil 250 Separate Output Option
Contact: Sales and Marketing Dept.
Date Product Introduced: June 27, 1987
Product Description & Applications: Available this fall for the Kurzweil 250 is an option that provides 12 direct monophonic outputs. Each Kurzweil 250 instrument voice may be assigned to one or more of these outputs, enabling the user to process each channel individually with separate reverb, EQ, etc., per output. In addition, the Separate Output option allows K250 sequencer tracks to be assigned to one or more of these outputs for one-pass multi-track recording. The Separate Outputs will be only featured as an option kit for any Kurzweil 250.
Basic Specifications & Suggested List Price: The Separate Output option requires replacement of the rear panel, a cable and a PC board. The option can be ordered from any authorized Kurzweil 250 dealer and installed by any authorized Kurzweil 250 service center. Suggested list price: to be announced.

MANHATTAN PRODUCTION MUSIC
 PO Box 1268
 Radio City Station
 New York, NY 10101
 (212) 586-7799
Product Name: CD Music Production Library
Contact: Norman Chesky (800) 227-1954
Product Description & Applications: A music production library available on compact disc, all cut edited into 60-, 30- and 10-second length cuts. Perfect for broadcast, industrial, or AV usage.

MANIAC MUSIC, INC.
 6052 N. Guilford Ave.
 Indianapolis, IN 46220
 (317) 251-0470
Product Name: Sustainiac™ Sustain System
Contact: Gary Osborne, VP
Date Product Introduced: June 27, 1987
Product Description & Applications: The first, and only, acoustic feedback device for electric guitar and bass that harmonically enhances every note and adds polyphonic infinite sustain at any volume. Attaches easily to any headstock to create unusual effects with feedback and sustain. No special playing techniques required. Easy to use.
Basic Specifications & Suggested List Price: Sustainiac™ Sustain System. \$299; Wireless Neck™ System: \$549; 120 and 220 volts, 50-60Hz, 60 watts, shipping weight 11 lbs.

THE MARTIN GUITAR CO.
 510 Sycamore St.
 Nazareth, PA 18064
 (215) 759-2837
Product Name: The Martin VTC
Contact: Tina Blum, adv mgr
Date Product Introduced: June 1, 1987
Product Description & Applications: The Martin VTC is an externally mounted passive volume and tone system for acoustic guitars equipped with a pickup and 1/4" output jack.
Basic Specifications & Suggested List Price: The Martin VTC is compact and lightweight. Suggested list is \$44.95.

THE MARTIN GUITAR CO.
 510 Sycamore St.
 Nazareth, PA 18064
 (215) 759-2837
Product Name: Stinger Electric Strings
Contact: Tina Blum, adv mgr
Date Product Introduced: May 15, 1987
Product Description & Applications: Stinger Electric Strings incorporate a new alloyed wrap wire wound around a key core and a black ball end/lock twist for use with fixed and tremolo bridges.
Basic Specifications & Suggested List Price: Stinger Electric Strings are supplied in air-tight packaging to ensure freshness. Available in all popular gauges. Suggested list price is \$7.95 (lead), \$32 (bass).



NEW ENGLAND DIGITAL CORPORATION
 Synclavier® Digital Audio System

NEW ENGLAND DIGITAL CORPORATION
 49 N. Main St., Box 546
 White River Jct., VT 05001
 (802) 295-5800
Product Name: Synclavier® Digital Audio System
Contact: Caryn Crump, marketing assistant
Date Product Introduced: Software Update September, 1987
Product Description & Applications: The Synclavier is a computerized digital audio workstation for music composition, performance, production and audio post-production. It integrates the functions of synthesis, sampling and sequencing while providing SMPTE lock and MIDI control features.
Basic Specifications & Suggested List Price: The Synclavier is a proprietary high speed minicomputer for digital audio with up to eight Gigabytes of on-line storage, 32 megabytes of onboard RAM, 64 channels of stereo audio and a 200-track sequencer.

OMNIMUSIC
 52 Main St.
 Port Washington, NY 11050
 (516) 883-0121
Product Name: Professional Broadcast Series
Contact: Kate Corrigan, Jean Oestreich, sales
Date Product Introduced: July 1, 1987
Product Description & Applications: The Professional Broadcast Series is a set of seven compact discs filled with instrumental beds for programming and commercial production. Each disc contains 30- and 60-second edits, as well as logos, stings and cues. The package comes with a full set of catalog pages as well as a style index. The music includes styles such as sports, mellow moods, classical, specialty and others. Ideal for radio and television stations looking to supplement their facilities with broadcast-quality music.
Basic Specifications & Suggested List Price: The cost for an annual license to use the Professional Broadcast Series is \$995. The music is all copyright-cleared, and under an agreement with the publisher (Omnimusic), customers will receive new music during the course of the year.

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 603/543-0033

PALMTREE INSTRUMENTS

5666 La Jolla Blvd., #1
La Jolla, CA 92037
(619) 546-8808

Product Name: Airtrigger
Contact: Pat Downes

Date Product Introduced: June 20, 1987

Product Description & Applications: The Airtrigger is an exciting new type of trigger source for the electronic percussionist. Connected in place of a drum pad in your electronic music, the Airtrigger senses when you shake it freely in the air, sending a standard trigger pulse to drive drum machines and trigger-to-MIDI converters. Like the original airdrums, the Airtrigger responds dynamically to your gestures, with a natural and intuitive response.

Basic Specifications & Suggested List Price: The Airtrigger is self-contained in a 7 2" long by 1 4" diameter tube covered with a machined closed-cell foam grip. It is powered by an internal 9-volt battery. The output pulse is accessible through a 1/4" jack on one end. The suggested retail price is \$99.

PASSAC CORP.

759 Ames Ave.
Milpitas, CA 95035
(408) 946-8989

Product Name: Sentient six

Contact: Shawn Herman, product mgr.

Date Product Introduced: June 1987, NAMM

Product Description & Applications: Sentient six guitar-MIDI controller. A rack mount controller and unique Passac Electronics integrated into a Kahler tremolo bridge system will retrofit on a wide range of guitars. One stereo cord transmits eight multi-plexed channels to the controller. A delete switch on the bridge allows normal transmission on a 2-conductor cord. Features include patented delay neutralization and pan functions assignable to Pick Direction. Pick position can be assigned to control MIDI commands such as modulation.

Basic Specifications & Suggested List Price: 8k RAM dedicated to sequencer and delay effects, tuning mode, education mode displays chords and riffs, transposition, continuous or semi-tone pitch bend LED on bridge lights when MIDI is on. Incorporating extremely sophisticated circuitry and artificial intelligence. Passac's Sentient six is another brilliant product from Australia. U.S. list Sentient six Controller \$995, 2520 MPX-1 Bridge System \$250.

PITECHNOS INC.

55 Delisle St.
Levis, QC, G6V 6K1 Canada
(418) 835-1416

Product Name: Resynthesizer

Contact: Nil Parent, vice president

Date Product Introduced: October 16, AES Show

Product Description & Applications: Technos' Resynthesizer offers a unique and revolutionary way of combining sound synthesis with signal processing, an alternative to sampling but much more exciting since it gives full access to the detailed parameters of a sound. The sound synthesis system, by far the most powerful on the market, is very easy to use and understand thanks to Technos' Intelligent Dynamic Analyser™ which performs almost instantly all the synthesis parameter settings that imitative synthesis would normally require.

Basic Specifications & Suggested List Price: A dedicated system (custom VLSI chips plus 32-bit CPUs) executes all operations in real time. Technos' Resynthesizer is polyphonic and multi-timbral (up to 1,024 dynamic oscillators). It comes with a beautiful skin-sensitive interface. An 88-note adjustable percussive action keyboard is optional. Dynamic range: 108 dB, synthesis sampling rate: 250kHz. Starts at \$12,995.

ROLAND CORP. US

7200 Dominion Circle
Los Angeles, CA 90040
(213) 685-5141

Product Name: D-50 Linear Synthesizer

Contact: Barbi Clark, communications

Date Product Introduced: January, 1987

Product Description & Applications: The D-50 Linear Synthesizer employs an innovative new technology which allows the user to create unique sounds by blending 16-bit PCM samples and digitally generated subtractive synthesis. Thirty-two such partials provide 16-voice polyphony. The D-50 offers powerful programming functions, digital semi-parametric equalization, eight separate chorus effects and 16-bit digital reverb and delay with 32 presets. Other features include full MIDI implementation and a 61-note velocity and pressure sensitive keyboard. Also available in a rack mount unit: D-550.

Basic Specifications & Suggested List Price: Synthesis method: LA synthesis (32 partials, seven structures), number of voices: 16-voice polyphony; keyboard: 61 notes, C2 to C7 (not applicable to D-550); onboard digital effects: 2-band semi-parametric equalizer x 2, stereo chorus x 2, reverb and delay; display: 80 character illuminated LCD; memory: 64 patches, 128 tones internal, 64 patches, 128 tones on optional 32 kilobyte IC card. Suggested retail price D-50 \$1,895, D-550 \$1,695.

NEW PRODUCTS**MUSIC PRODUCTS**

1988

ROLAND CORP. US
7200 Dominion Circle
Los Angeles, CA 90040
(213) 685-5141

Product Name: S-550 Digital Sampler (Rack Mount)

Contact: Barbi Clark, communications

Date Product Introduced: June, 1987

Product Description & Applications: The S-550 is a "open-system" design 12-bit sampler with extensive editing and performance capabilities. 1.5 megabytes of memory allow the S-550 to store 64 tones and 16 patches. Sampling time at 30kHz is 28.8 seconds, 56.6 seconds at 15kHz. 16-voice polyphony may be routed to eight separate polyphonic outputs and are accessed through eight MIDI channels simultaneously. Crossfade and auto-loop modes, real time digital filtering, pre-trigger and previous sampling and direct support of monochrome and color CRTs round out the features of the rack mounted unit.

Basic Specifications & Suggested List Price: Sampling time 28.8 seconds at 30kHz, 56.6 seconds at 15kHz, onboard RAM 1.5 megabyte, 64 tones, 16 patches, resolution: 12-bit sampling resolution, 16-bit DAC, outputs: eight polyphonic outputs; loop modes: auto, real time audible and visual, crossfade, number of voices: 16-voice polyphony through eight separate MIDI channels.

SIMMONS ELECTRONICS (USA) INC.

23917 Craftsman Rd.
Calabasas, CA 91302
(818) 884-2653

Product Name: SDX Computer Percussion System

Contact: Tom Schilling, customer service manager

Date Product Introduced: June, 1987

Product Description & Applications: SDX is a screen-based, 16-bit sampling system, designed for use in recording and performing drums. It is a 16-voice system, triggerable via MIDI or new "zone intelligent" drum pads which provide sample switching relative to position, in addition to dynamics. There is a screen-based digital recording package with on-screen editing and SMPTE and an internal hard disk option. **Basic Specifications & Suggested List Price:** Standard console with 2 Meg RAM, \$7,960. Full ten-piece drum set with console, \$9,990.



SOUND IDEAS
Toronto, Ontario, Canada

SOUND IDEAS

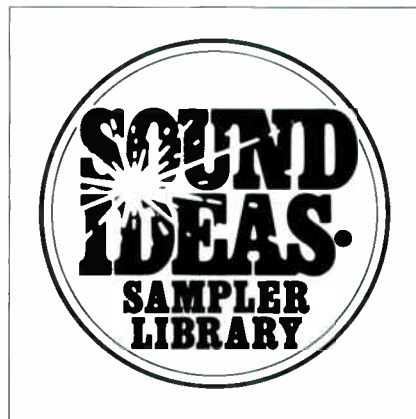
86 McGill St.
Toronto, Ontario, M5B 1H2 Canada
(800) 387-3030
(416) 977-0512, Canada

Product Name: Series 2000 Digital Sound Effects Library

Contact: Michael Bell, sales manager

Date Product Introduced: April, 1987

Product Description & Applications: Features over 2,000 all new digitally recorded stereo sound effects on 22 compact discs. Each library comes with its own master catalog and carrying case. The Series 2000 can be used effectively on its own or in harmony with the Series 1000 collection. Together they provide you with 50 CDs of over 5,000 sound effects! **Basic Specifications & Suggested List Price:** Series 2000 \$975 U.S. Combined Series 1000/2000 \$1,850 U.S.



SOUND IDEAS
Sound Ideas Sampler Library

SOUND IDEAS

86 McGill St.
Toronto, Ontario, M5B 1H2 Canada
(800) 387-3030
(416) 977-0512, Canada

Product Name: Sound Ideas Sampler Library

Contact: Michael Bell, sales manager

Date Product Introduced: July, 1987

Product Description & Applications: This comprehensive collection was specifically designed for use with samplers. Over 3,100 digitally recorded instrumental, percussive and vocal sounds including 375 specifically selected sound effects make up this incredible package of six CDs. In all, over 135 instruments were recorded with each individual scale covered in 1/3-note increments. The library includes a catalog which provides a fully cross-referenced alphabetical listing as well as a CD track and index listing.

Basic Specifications & Suggested List Price: Regular price \$495—was specifically designed for use with samplers.

SYCO SYSTEMS

C/O CREATIVE DIMENSIONS ASSOCIATES
PO Box 600-817
Sherman Oaks, CA 91403
(818) 904-9078

Product Name: M16-Digital MIDI Matrix

Contact: Rita Lambert

Date Product Introduced: December, 1986

Product Description & Applications: The M16 is a 16 x 16 matrix configuration with remote keypad which controls and displays the matrix allowing bulky MIDI and power connections to be situated out of sight. Up to 32 matrix patches may be edited, stored or recalled. The M16 also has the ability to name each source and destination with an 8-character label displayed in the LCD during editing. The M16 can also send individual MIDI program changes to all of the 16 destinations when a new matrix patch is situated allowing one MIDI program change from a master keyboard to configure not only the routing of your MIDI system but the program of all the instruments connected, in less than a second! Expander units also available.

Basic Specifications & Suggested List Price: 16 x 16 MIDI matrix, remote keypad with LCD, 32 user-definable patches, instrument labels can be assigned, MIDI program changes can be assigned, 16 MIDI indicator LEDs, intelligent patching. Suggested retail \$1,295.

360 SYSTEMS

18740 Oxnard St., Unit 302
Tarzana, CA 91356
(818) 342-3127

Product Name: Professional MIDI Bass

Contact: Robert Easton, president

Date Product Introduced: June, 1987

Product Description & Applications: Professional MIDI Bass is a rack mount sampled bass expander that can be played from any MIDI controller. Eight multi-sample bass sounds are included in the basic unit, with sockets available to accept eight additional bass chips. Pro MIDI Bass extends the range of user-modifications to include programmable zones, transposition, filter settings, decay, release and volume. Velocity controlled accent allows a second voice to play when keyboard velocity exceeds a predetermined level. All functions are stored in non-volatile RAM. All bass sounds are digitally recorded, studio-quality samples.

Basic Specifications & Suggested List Price: Basic sounds: flat picked Precision Bass, thumbled funk bass, popped funk bass, flat picked Jazz Bass, pizzicato standup acoustic bass, finger-picked precision bass, flat picked Precision Bass, flat picked Steinberger bass, multiple-samples; yes; number of zones: two, display: backlight 2-line LCD, MIDI control, notes, velocity, patch change, pitch bend, MIDI channel Onn, or 1-16. Thru jack provided, dimensions: 1 3/4" x 19" rack mount.

TECHTONICS

719 Longfellow Ave.
Hermosa Beach, CA 90254
(213) 374-8872

Product Name: Techtonics 2000
Contact: Jeffrey Pack, president

Product Description & Applications: The Techtonics 2000 electronic bass drum trigger is completely adaptable to virtually any pedal! Adjustable clamps and trigger so your favorite pedal slips in just like an acoustic bass drum. 3-pin and 1/4" jacks make it compatible with all drum brains and rhythm machines. Both jacks act as input and output so multiple bass drums are as easy as connecting two or more Techtonics 2000s together. Non-skid rubber base plate eliminates creep on any surface. Lightweight and portable.

Basic Specifications & Suggested List Price: Suggested list price: \$125.95.

TRF PRODUCTION MUSIC LIBRARIES

40 E. 49th St.
New York, NY 10017
(212) 753-3234

Product Name: Chappell, TeleMusic & MP 2000 Compact Discs

Contact: Michael Nurko

Date Product Introduced: October, 1987

Product Description & Applications: New digitally recorded, mixed and mastered production music on compact discs. Music selections are in several categories including AV Industrial, Sports, Classical, Rock, Children's, Period, Country, Dramatic, Jazz and Jingles with excellent contemporary electronic and orchestral opening and closing themes. Music available in full length and jingle length versions.

Basic Specifications & Suggested List Price: Price of compact discs not available at press time. Music may be licensed by neededrop rates, or Special Annual Blanket Licenses for unlimited use are available at very economical rates. Rate sheet with specific licensing rates and new catalogs are available upon request

VALHALA MUSIC, INC.

Box 20157
Ferndale, MI 48220
(313) 548-9360

Product Name: ESQ1 & FM Sound Accessories

Contact: David Thompson, Bob Wilson

Product Description & Applications: DX7 sound patch library book. ESQ1 programmers guide. C64 software libraries for DX7/TX7/DX21/DX100/ESQ1. 80-, 160- and 320-voice ESQ1 ROM cartridges.

Basic Specifications & Suggested List Price: All Commodore 64 programs 100% machine language for fast access. \$99.95 and less. ESQ1 read only memory cartridges at \$59.95, \$116.95 and \$169.95

WINDOWS DREAM PRODUCTIONS

(FORMERLY H&A PROD.)
4288 Greenwood

Holt, MI 48842

(517) 694-7161

Product Name: No. 1 "Home Recording for Musicians"

Date Product Introduced: July 1

Product Description & Applications: Tape No. 1 *Home Recording for Musicians*: types of home studios, techniques, effects and production tips. Other titles in production: *Home Recording II*, *Producing Your Own Tape*, *Trouble Shoot Equipment for Musicians*.

Basic Specifications & Suggested List Price: List price \$15 for VHS. Beta

TRF PRODUCTION MUSIC LIBRARIES

40 E. 49th St.
New York, NY 10017
(212) 753-3234

Product Name: New Releases

Contact: Michael Nurko

Date Product Introduced: December, 1987

Product Description & Applications: Over 50 record albums/compact discs of new production music has been added to the TRF Alpha, Bosworth, Chappell, MP 2000, Music Scene and Tele Music Production Music Libraries. The music is divided into several categories including AV Industrial, Sports, Classical, Rock, Children's, Period, Country, Dramatic, Jazz and Jingles with excellent contemporary electronic and orchestral opening and closing themes. New releases are being recorded, mixed and mastered digitally and are available on both compact discs and high quality digitally mastered stereo records as well as first-generation digitally mastered tapes.

Basic Specifications & Suggested List Price: Record albums available at \$9 per album. Prices of compact discs are unavailable at present time. Either format can be received "on approval." Music may be licensed by neededrop rates, or Special Annual Blanket Licenses for unlimited use are available at very economical rates. Rate sheet with specific licensing rates and new catalogs are available upon request

UNISYNTH

Distributed by Suzuki Corp.

Box 261030

San Diego, CA 92126

(619) 566-9710

Product Name: XG-1m MIDI Guitar Controller

Date Product Introduced: June, 1987

Product Description & Applications: The stringless neck on the Unisynth XG-1m MIDI guitar controller lets players get their hands on MIDI without having to reach deep into their pockets! This exciting new fret-switched concept delivers the tracking and response performance expected in MIDI guitar evolution. In fact, the absence of strings on the neck promotes faster and more comfortable playing.

Basic Specifications & Suggested List Price: An extended range tremolo arm gives guitarists the same control that a "thumb-wheel" has on a keyboard. The right hand steel strings are fully touch sensitive and the XG-1m even includes an electronic capo that makes transposing a thing of the past. Connects to any MIDI keyboard, expander or MIDI device. Price: \$299

YAMAHA INTERNATIONAL

Box 6600

Buena Park, CA 90622

(714) 522-9011

Product Name: MSS1 MIDI Synchronizer

Contact: Digital Musical Instrument Division

Date Product Introduced: June, 1987

Product Description & Applications: The Yamaha MSS1 MIDI synchronizer provides an easy, cost-effective way to lock any clock-driven MIDI device to SMPTE time code replayed from a multi-track or videotape. Features: built-in time code generator; 10-bank memory for storing tempo data; external RAM cartridge data storage; and MIDI event mode for synchronized transmission of program changes and other MIDI control data.

Basic Specifications & Suggested List Price: Fully compatible with all SMPTE formats. Price: \$1,195.

AUDIO AFFECTS

213/871-1104 818/980-4006

STUDIO EQUIPMENT FOR HIRE

NEW EQUIPMENT:

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NEW PRODUCTS

RECORDING DEVICES AND TAPE

1988

ACES (U.K.) LIMITED

Featherbed Lane
Shrewsbury, Shropshire, SY1 4NJ United Kingdom
(0743) 6671/236672
Product Name: Aces Omega-SML Multi-tracks
Contact: A Talbot, sales manager
Date Product Introduced: June, 1987 APRS
Product Description & Applications: Omega 24-/32-track 2" recorder. The Omega is prewired for 32 tracks plus full autolocate SML1216 MKII 1/2" 16-track recorder supplied with remote control.
Basic Specifications & Suggested List Price: Omega 2" recorder fitted 24-track prewired for 32 tracks, high specification with autolocate

AGFA-GEVAERT, INC.

100 Challenger Rd.
Ridgefield Park, NJ 07660
(201) 440-2500
Product Name: PEM291D
Contact: Joe Tibensky, audio products mgr.
Date Product Introduced: Fall, 1987
Product Description & Applications: PEM291D digital studio mastering tape: Superior CrO₂ formulation, featuring excellent signal-to-noise ratio which ensures extremely low drop-out rate. Compatible with both PD and DASH formats. PEM291D is available in 1/4", 1/2" and 1" with lengths of 5,000', 7,500' and 10,000'.

AGFA-GEVAERT, INC.

100 Challenger Rd.
Ridgefield Park, NJ 07660
(201) 440-2500
Product Name: PE619I
Contact: Joe Tibensky, audio products mgr.
Date Product Introduced: Summer, 1987
Product Description & Applications: Improved version of the Agfa standard music grade bulk audio cassette tape. Features improved binder, providing excellent mechanical stability, clean running and superior winding.

AMPEX CORP., MAGNETIC TAPE DIVISION

401 Broadway
Redwood City, CA 94063
(415) 367-3809
Product Name: 456 Professional Audio Recording Tape
Contact: Steve Smith, marketing manager
Product Description & Applications: Grand Master 456 Professional Analog Mastering Tape is available in 1/4", 1/2" and 2" widths in 1,200', 2,500' and 5,000' lengths. All 2" master tapes are end-to-end tested.

AMPEX CORP., MAGNETIC TAPE DIVISION

401 Broadway
Redwood City, CA 94063
(415) 367-3809
Product Name: 467 Professional Audio Recording Tape
Contact: Steve Smith, marketing manager
Product Description & Applications: 467 digital mastering tape available in 1/4", 1/2" and 1" widths and 4,600', 7,200' and 9,700' lengths. All widths and lengths are end-to-end tested. 467 digital audio cassettes are available in 30, 60, 75 and 80 min. lengths.

COMPUSONICS CORP.

2345 Yale St.
Palo Alto, CA 94306
(415) 494-1184
Product Name: DSP 1000 Series
Contact: Dave Schwartz, pres.
Date Product Introduced: April 5, 1987
Product Description & Applications: The CompuSonics DSP 1000 Series are audio computers that record on optical, floppy



COMPUSONICS CORP.
DSP 1000 Series



COMPUSONICS CORP.
DSP-1500 Series

and hard disk drives. The stereo recordings may be edited via the front panel controls or remotely on an IBM PC or Apple Macintosh computer. The 1000 Series computers can replace tape recorders in many applications.

Basic Specifications & Suggested List Price: DSP-1000XLR: 88 dB S/N, 20-20,000Hz, \$7,995, 5 1/4" optical disk recorder/editor. DSP-1500: 88 dB S/N, 20-15,000Hz, \$5,995, 5 1/4" floppy disk recorder. DSP 1200: playback-only version of DSP-1500 for radio broadcast, \$4,995

CORNING GLASS WORKS

MP-21-04-2
Advanced Products Department
Corning, NY 14831
(607) 974-4286
Product Name: Data Shield®
Contact: Lorenzo Pitts, sr. sales representative
Date Product Introduced: January, 1987
Product Description & Applications: Precision glass tape reels eliminate many problems for recording equipment users and computer operators, who need reels of consistently accurate dimension and stability. Glass reels are stronger than aluminum or plastic, will not warp or bend and they let operators see at once the tape pack condition and how much is left.

Applications: mastering take-up reels, professional video and professional audio.

Basic Specifications & Suggested List Price: Reel-to-reel standard diameters 10.5" to 16", standard widths 1/2", 1" and 2". Conforms to federal specifications W-E-175D and W-R-175/6A. Price list based on quantity ordered. Corning invites RFQs for non-standard flange sizes and customer-supplied hubs.

DIGITAL AUDIO RESEARCH, LTD.

2 Silverglade Business Park
Leatherhead Rd.
Chessington, Surrey, KT9 2QL England
0372742848
Product Name: SoundStation
Contact: Kevin Dauphinee, director, marketing
Date Product Introduced: October 16, 1987
Product Description & Applications: SoundStation II, the second generation digital audio recorder and production center, is specifically designed for use in professional sound facilities. Consisting of a control console, a central processor and disk-storage unit, SoundStation II eliminates constraints on the creative sound production process through comprehensive editing capabilities and intuitive operations.
Basic Specifications & Suggested List Price: Both original recording and program transfer are easily achieved by SoundStation II from either digital or analog sources. An operator may perform non-destructive, non-degenerative edits with instant access of program segments for edit rehearsal with normal or variable speed playback. Cross-fading, "reel-rocking," splice adjustment and time-slipping are among the many useful features provided by SoundStation II. Removable media allow interchangeability of SoundStation II audio program material.

ELECTRO SOUND INC.

160 San Gabriel Dr.
Sunnyvale, CA 94086
(408) 245-6600
Product Name: 8000 Modified Cassette Slave Recorder
Contact: Mark Nevejans, vice pres. sales
Date Product Introduced: June, 1987
Product Description & Applications: Electro Sound's Series 8000 Modified High Speed Slave features microprocessor-based logic control; automatic stop (defeatable) if trouble is sensed; a constant tension system for both takeup and hold-back; test points for record amplifier output, bias and head current; automatically switched equalization and bias networks; a lift-top cabinet. The packer arm assures a smooth tape pack. Ferrite heads ensure increased head life. The slave accommodates 14" diameter pancakes with adjustable constant tape tension.
Basic Specifications & Suggested List Price: Frequency response: 40 to 18,000 Hz, +/- 2 dB; signal-to-noise: biased tape noise on copies does not exceed tape noise by more than 2 dB; bias frequency: 8MHz; flutter & wow: not more than 0.05% WRMS measured from 0.5 to 250Hz; tape speed accuracy: +/- 0.1%; list price \$18,900.



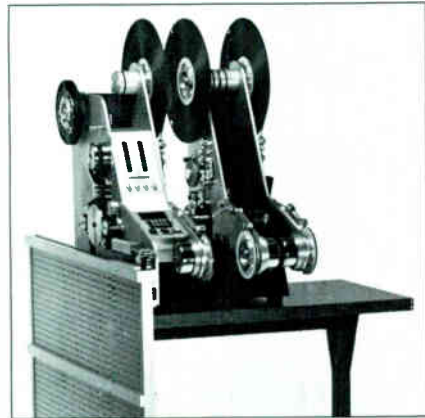
FIDELIPAC CORPORATION
Dynamax Cobalt NAB Tape Cartridge

FIDELIPAC CORPORATION

PO Box 808
Moorestown, NJ 08057
(609) 235-3900
Product Name: Dynamax Cobalt NAB Tape Cartridge
Contact: Art Constantine, V.P. marketing
Date Product Introduced: April 1, 1987
Product Description & Applications: Dynamax Cobalt is two new products in one. The NAB cartridge shell is constructed of premium engineering grade ABS plastic, with an improved tape path. The cartridge offers longer service life without user adjustments, greatest high-frequency headroom, extended

high-frequency response, lower flutter and superior phase uniformity. The tape is a totally new formula of cobalt encapsulated ferric particles, yielding increased high-frequency headroom while remaining bias-compatible with most high-output, low-noise tapes.

Basic Specifications & Suggested List Price: Tape coercivity (Hc) 390 Oersts; retentivity (Br): 1,400 Gauss; squareness: 89%; cartridge NAB Type AA; maximum tape load: 394 feet (10.5 minutes at 7.5 ips); base color: charcoal; top color: smoke grey; stereo phase uniformity: ± 50 degrees at 12.5kHz.



MAGNEFAX INTERNATIONAL, INC
3800 Series Duplicator

MAGNEFAX INTERNATIONAL INC.
Route 1, Box 764
Rogers, AR 72756
(501) 925-1818
Product Name: 3800 Series Duplicators
Contact: Dennis Tallakson, president

Product Description & Applications: Like its predecessors, the 3800 Series machines use the time-proven Common Mandrel Capstan Design to provide unmatched quality and reliability. Two models are available, both in 3 slave configuration: the 3801 which uses a 1/2" master, and the 3802 which employs a 1/4" master format. Other features include motorized tape wipers, individual audio and bias adjustments for each head, high capacity bin, synchronized bias amplifiers, digital metering, high precision tape path, and extended headroom amplifiers.

Basic Specifications & Suggested List Price: Production for both models is 125 C-60s per hour. All of these features are also available on the 7800 Series machines which offer a seven slave design and a 2400 C-60s per hour production capability. For complete prices and information, contact Dennis Tallakson, president.

mitsubishi Pro Audio Group
225 Parkside Dr.
San Fernando, CA 91340
(818) 898-2341

Product Name: Westrex 9635 Digital Photographic Stereo Film Recorder

Contact: Bill Windsor, senior marketing exec
Date Product Introduced: January, 1987

Product Description & Applications: The 9635 Recorder includes the most advanced solid state electronics ever developed for photographic recording, featuring greatly improved transient and frequency response, anticipatory noise reduction, and a specially developed compressor/limiter. The digital delay circuit is utilized in a unique anticipatory noise reduction system which configures the optimum noise reduction envelope to eliminate valve clash on transients, and minimum valve opening for the lowest noise possible.

Basic Specifications & Suggested List Price: Standard features are front panel switchable active electronic film loss equalization, switchable high and low pass electronic filters with positions for recording 35mm, 16mm or super 8 tracks, positive light valve overload protection, accurate metering of level and noise reduction, digital readout and control of the current regulated lamp supply with an accuracy of .01 amps, complete test oscillator and a cross modulation generator.



NEW ENGLAND DIGITAL CORPORATION
Direct-to-Disk™ Multi-track Recorder

NEW ENGLAND DIGITAL CORPORATION
49 N. Main St., Box 546
White River Jct., VT 05001
(802) 295-5800

Product Name: Direct-to-Disk™ Multi-track Recorder

Contact: Caryn Crump, marketing assistant

Date Product Introduced: October, 1987 AES Show

Product Description & Applications: Direct-to-Disk is the first commercially produced hard disk-based digital multi-track recorder offering 16-bit/100kHz fidelity and now available in stand-alone remote operable 4-, 8- and 16-track configurations.

Basic Specifications & Suggested List Price: Direct-to-Disk is a computer-based multi-track recorder, with full software-based editing capabilities, and maximum continuous recording times of over three hours at 50kHz.

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- Random access sound effects



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World Radio History



QCA
QCA "Clearchrome" Blank Cassettes

QCA
2832 Spring Grove Ave.
Cincinnati, OH 45225
(513) 581-8400

Product Name: QCA "Clearchrome" Blank Cassettes

Contact: Dan Dorf, sales rep
Date Product Introduced: Apr 1, 1987

Product Description & Applications: Clear Shape Mark 10 shell, loaded with BASF chrome tape. Each cassette with labels and inserted individually shrink-wrapped in high quality clear No-elco box.

Basic Specifications & Suggested List Price: C-15 (7.5 min per side) \$0.85 ea., C-30 (15 min per side) \$0.95 ea., C-46 (23 min per side) \$1.05 ea., C-60 (30 min per side) \$1.15 ea., C-90 (45 min per side) \$1.35 ea. \$1 per order handling charge. Minimum order \$20. All prices include shipping.

SONY PROFESSIONAL AUDIO
1600 Queen Anne Rd.
Teaneck, NJ 07666
(201) 833-5200

NEW PRODUCTS RECORDING DEVICES AND TAPE

1988

Product Name: PCM-3402 Digital Audio Recorder

Contact: Gus Skinas, product manager

Date Product Introduced: Fall 1987

Product Description & Applications: The PCM-3402 is a 2-speed, 2-channel 1/4" digital audio recorder. Based on the DASH format, the machine records at both 7.5 ips and 15 ips. It also features electronic editing, with none of the generation loss associated with analog. Digital RAM storage enables the producer to audition and edit beforehand and refine the edit point. By connecting two PCM-3402s, it is possible to edit to an accuracy of approximately one millisecond.

Basic Specifications & Suggested List Price: Sampling rates: 44.056kHz, 44.1kHz or 48kHz, quantization: 16-bit linear; variable speed: +/-12.5%, synchronization accuracy: within 0.4 milliseconds (using built-in synchronizer); AES/EBU for connection to other digital recorders and processors; Sony SDIF-2 digital I/O for direct connection to Sony PCM-1610/1630. Price: approximately \$28,000.

SOUNDCRAFT USA

PO Box 2200, 8500 Balboa Blvd.

Northridge, CA 91329

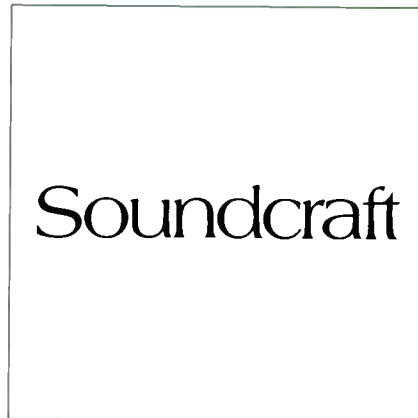
(818) 893-4351

Product Name: Saturn

Contact: David Kimm, sales manager

Product Description & Applications: Professional 24T tape M/C with all functions including line-up controllable from remote. All facilities can be included in memorized function keys. Audio performance is one of the best, further expansions include auto align, chase synchronizer and code reader. An outstanding machine suitable for any high end studio.

Basic Specifications & Suggested List Price: Wow & flutter: 0.03%, speed stability: 0.05%, speed up to 600 ips in <3 secs., S/N ratio (510 n Wb/m): 30 ips 66 dB, built-in oscillator, freq. resp. 30 ips ±2 dB 60Hz-27kHz. Prices from \$42,500.



SOUNDCRAFT USA
Northridge, CA



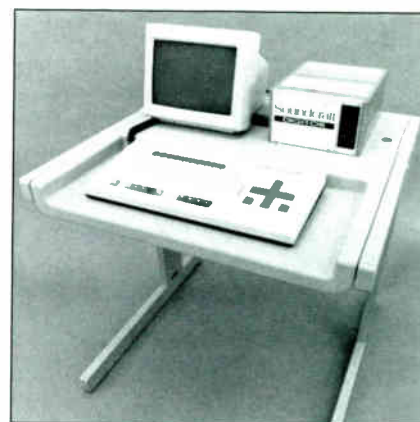
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Saturn

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SOUNDCRAFT USA
Digitor

SOUNDCRAFT USA

8500 Balboa Blvd.

Northridge, CA 91329

(818) 893-4351

Product Name: Digitor

Contact: David Kimm, sales manager

Date Product Introduced: Europe June, 1987/USA October, 1987

Product Description & Applications: Digitor is a new concept in audio editing. It records up to six minutes of stereo program into RAM memory. The program may then be edited with great accuracy in a wide variety of ways, from basic copying, moving and deleting sections, to more advanced tasks such as pitch transposition. The audio is recorded full 16-bit, 44.1/48kHz (switchable) sampling and is initially analog in and out, but digital interfaces are soon to be available.

Circle #208 on Reader Service Card



STUDER REVOX AMERICA, INC.
A820 Multichannel Recorder

STUDER REVOX AMERICA, INC.
1425 Elm Hill Pike
Nashville, TN 37210
(615) 254-5651
Product Name: A820 Multichannel Recorder
Contact: Thomas E. Mintner, vice president and general manager
Date Product Introduced: November, 1986
Product Description & Applications: The A820 will be available in 8-, 16- and 24-channel formats. The transport accepts 14" reels and powerful new motors combined with advanced microprocessor servo systems to permit fast wind speeds up to 50 ft./sec. Three tape speeds and reverse play are provided. All operating keys are user-programmable with a choice of over 40 functions from the internal software library. Audio parameters may be set for all 24 channels automatically, simultaneously with digital memory storage for two tape formulations. Other features include Dolby HX Pro, amorphous metal heads, serial communication with overbridge (remote placement option), and optional fully integrated NR (Dolby A/SR or Telcom c+).
Basic Specifications & Suggested List Price: Professional user net price is \$62,500.

STUDER REVOX AMERICA, INC.
1425 Elm Hill Pike
Nashville, TN 37210
(615) 254-5651
Product Name: Studer A721 Cassette Deck
Contact: David Bowman, director of professional dealer products
Date Product Introduced: October, 1987
Product Description & Applications: The A721 is designed for critical quality professional cassette recording applications. Features include die-cast transport chassis, four direct drive motors, microprocessor transport control, and azimuth-stable hinged headblock. Audio parameter setting is automatic with digital storage for six formulations. Also included are Dolby B-C NR, Dolby HX Pro, balanced inputs and outputs (max +21 dBu), input calibration pots, real time counter, 2 memory locate, loop function, and both serial and parallel remote facilities.
Basic Specifications & Suggested List Price: Frequency response (type II) 20Hz to 20kHz +2/-3 dB, S/N ratio (A wtd. type II, Dolby C) 71 dB. Professional user net \$2,450.

TASCAM/TEAC PROFESSIONAL DIV.
7733 Telegraph Rd.
Montebello, CA 90640
(213) 726-3303
Product Name: Tascam ATR 60/15
Contact: Jon Bliese
Date Product Introduced: AES, Fall 1987
Product Description & Applications: A new high performance 16-track analog recorder addition to the successful ATR-60 line. Designed to continue the standard of excellence established by Tascam and employing the latest refinements in tape handling and synchronizer interface technology.
Basic Specifications & Suggested List Price: Approximate suggested retail \$15,000.

UHER OF AMERICA
7067 Vineland Ave.
North Hollywood, CA 91605
(818) 764-1120

Product Name: Uher CR 1602
Contact: John Belgioro, president
Date Product Introduced: January 1, 1988
Product Description & Applications: Professional heavy-duty portable stereo cassette recorder which provides high performance and reliability along with innovative features for commercial and industrial application. This unit includes auto reverse, long-play capability of up to eight hours with 2 speeds, Dolby, voice activated, film sync dubbing and fully electronic remote controlled. Time code capability optional available.



VERSADYNE INTERNATIONAL, INC.
1500 Series High Speed Tape Duplication System

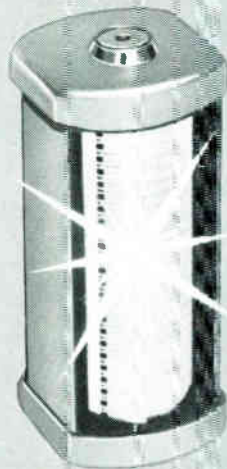
VERSADYNE INTERNATIONAL, INC.
504-D Vandell Way
Campbell, CA 95008
(408) 379-0900
(800) 233-9370, outside CA
Product Name: 1500 Series High Speed Audio Tape Duplication System

tion System
Contact: Robert W. Kratt, president
Date Product Introduced: November, 1986 AES Convention
Product Description & Applications: The 1500 Series duplicator is designed for the professional duplicator providing the highest quality duplicated copies. The system boasts features such as HFE™ (bias controlled high frequency record enhancement), LX3 level expand system and the unique Agi-tape™ loop-bin. The system is also offered with 128 1 duplication capability for high volume spoken-word production.
Basic Specifications & Suggested List Price: The 1500 Series duplicates at 32 1, 64 1 and 128 1. Frequency response 32 1=40-18kHz, 64 1=40-15kHz and 128 1=40-8kHz, max copy deviation from master tape +/-3 dB. Loop-bin capacity=2,000 feet of 2 0 mil 1/2" tape. Bias freq=5MHz buffer type system. Standard features: HFE™ enhances recorded frequencies by as much as 10 dB, LX3™ level expand system provides up to 6 dB of greater head room at all frequencies.

WAVEFRAME CORPORATION
4725 Walnut St.
Boulder, CO 80301
(303) 447-1572
Product Name: The AudioFrame
Contact: Steve Cunningham, VP marketing
Date Product Introduced: October, 1987
Product Description & Applications: The AudioFrame is a modular digital audio workstation featuring high-quality sound generation, digital multi-track recording and random access editing, digital mixing and digital signal processing. Processing is performed in the digital domain with arithmetic precision that provides greater than 16-bit performance throughout the system. The modular design allows system configurations to fit specific needs, and provides a cost-effective means to expand the system. Synchronization capabilities include MIDI, as well as both longitudinal and vertical SMPTE.
Basic Specifications & Suggested List Price: The AudioFrame consists of two major components: the Digital Audio Rack and an AT compatible computer. The Digital Audio Rack supports up to ten digital audio modules, all operating from a master 44.1kHz clock. Output resolution is guaranteed to be 16-bit, while distortion is less than 0.003% THD. Frequency response at the output is 20Hz to 20kHz (+/-1 dB) and the dynamic range is greater than 108 dB. Prices for a basic sampling system start at \$26,000.

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Circle #209 on Reader Service Card

NEW PRODUCTS

SIGNAL PROCESSING DEVICES

1988

ADA SIGNAL PROCESSORS, INC.
7303D Edgewater Dr.
Oakland, CA 94621
(415) 632-1323

Product Name: MQ-1 Programmable MIDI Equalizer
Contact: Dave Gonden

Date Product Introduced: April, 1987

Product Description & Applications: A fully programmable 2/3-octave stereo MIDI equalizer designed for automated equalization in audio-for-video post-production, MIDI and project studios. The MQ-1 has full MIDI implementation. All parameters are addressable via SYSEX and all programs are reassignable. Additional programs can be up- or down-loaded via SYSEX, and the MQ-1's firmware is capable of reading MIDI time code (MTC) which locks MIDI devices to SMPTE. The MQ-1 can internally store MTC cue lists.

Basic Specifications & Suggested List Price: Constant-Q filters minimize sideband frequency interaction; active balanced inputs; battery-backed memory for program, parameter, MIDI and cue list storage; 12 dB boost/cut on 2/3-octave iso centers, 102 dB minimum EIN, and LED indicators for visual curve display. The MQ-1 comes with a one-year parts and labor warranty. Suggested list price is \$699.95.

ADA SIGNAL PROCESSORS, INC.
7303D Edgewater Dr.
Oakland, CA 94621
(415) 632-1323

Product Name: MP-1 Programmable MIDI Tube Pre-Amp
Contact: Dave Gonden

Date Product Introduced: July, 1987

Product Description & Applications: A fully programmable tube preamp with 128 programs and full MIDI. The MP-1's multi-function design incorporates the latest in digitally controlled technology with the superior tone quality of tubes. There are three separate voicing modes: Tube-Clean, Tube-Distortion and Solid State. Tube-Clean and Tube-Distortion utilize two 12AX7A low-noise tubes for either full compression or maximum saturation in four gain stages. Solid State mode has two gain stages which bypass the tube circuitry to produce clean sounds from out-of-phase tones to a sparkling stereo chorus. Each voicing mode has three programmable gain levels: Overdrive 1, Overdrive 2 and Master Gain.

Basic Specifications & Suggested List Price: Other features include a digitally controlled 4-band EQ with presence for precise tone shaping and a programmable stereo chorus with adjustable depth, rate and delay time. The MP-1's advanced MIDI technology includes MIDI program mapping, MIDI channel select and MIDI In/Out/Thru. The MP-1 comes with a one-year parts and labor warranty. Optional MC-1 foot controller for remote access to programs. Suggested retail price MP-1 \$699.95, MC-1 \$199.95.

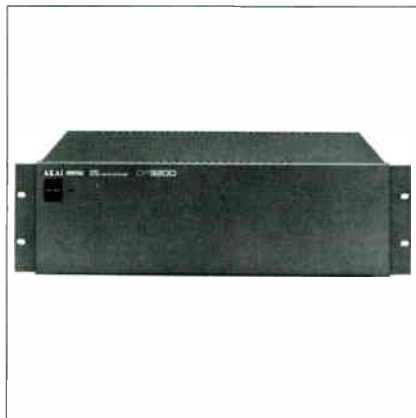
AKAI DIGITAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

Product Name: DP3200 Audio Digital Patchbay System
Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The DP3200 is an audio digital matrix patchbay. It accepts up to 32 balanced audio inputs and routes them to 32 balanced outputs. Audio connections are made by multi-cable junction boxes or can be wired by the studio. Switching is controlled by the PG 1000 Patchbay Programmer. Patching connections can be stored in 64 banks of memory, and sequenced in sync with SMPTE. Data is displayed visually on the MZ 1000 monitor.

Basic Specifications & Suggested List Price: DP3200—32 balanced inputs and 32 balanced outputs via multi-cable, 64-bank memory with 10 steps per bank; multiple units may be cascaded. PG 1000 controls up to four DP3200s, SMPTE generator/reader, RS232 port, MIDI In, Out, Thru, output to printer. MZ 1000—12" color CRT, RGB, revolving base.



AKAI DIGITAL
DP2000 Audio/Video Digital Patchbay System

AKAI DIGITAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

Product Name: DP2000 Audio/Video Digital Patchbay System

Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The DP2000 is an audio and video digital matrix patchbay. It puts routing of audio and video signals under the control of the PG 1000 patchbay programmer. With the programmer, connections can be made and stored in memory, and visually seen on the MZ 1000 color monitor. A sequence of patch changes can be created and synched by SMPTE Time Code. The DP2000 System is perfect for post-production and multi-screen displays.

Basic Specifications & Suggested List Price: DP2000—16 balanced audio inputs and outputs, multi-cable connector; 16 75 ohm BNC video inputs and outputs; 64-bank memory; gen. lock in; PG 1000—controls up to four DP2000s; SMPTE generator/reader; RS232 port, MIDI In, Out, Thru; output to printer; MZ 1000—12" color CRT, RGB, revolving base.

AKAI PROFESSIONAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

Product Name: PEQ6

Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The PEQ6 is a MIDI programmable, 7-band equalizer. For use in complex setups, it has 6 inputs and 6 outputs. EQ settings can be memorized into any of the 32 banks. Banks can be selected on the front panel, by footswitch or MIDI program change. EQ boost and cut settings are visually indicated with LEDs.

Basic Specifications & Suggested List Price: 19" rack-mountable/1U; 6 inputs, 6 outputs, 1/4" phone; MIDI In, Out, Thru; 7 bands; Gain +/-12 dB, input impedance 47k ohms, output impedance 600 ohms; frequency response 20-20k Hz +/-0.5 dB. \$449.95.

AKAI PROFESSIONAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

Product Name: ME30PII

Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: The ME30PII is a pro-

grammable MIDI patchbay designed for switching between MIDI instruments. Up to 4-input channels and 8-output channels can be utilized. MIDI Merge allows two inputs to control a single output. LED display shows status of connections. Patching is memorized into any of 32 banks, and data can be copied from one bank to another. Banks can be selected on the front panel, by footswitch, or MIDI program change. Basic Specifications & Suggested List Price: 19" rack-mountable/1U, 4 MIDI inputs, 8 MIDI outputs, MIDI Merge, footswitch jack, 8 LEDs. \$299.95.

AKAI PROFESSIONAL
PO Box 2344
Fort Worth, TX 76113
(817) 336-5114

Product Name: MB76

Contact: Mike McRoberts, director

Date Product Introduced: June 27, 1987

Product Description & Applications: MIDI programmable mix bay. The MB76 is a compact, 1U size, programmable audio patchbay. It has 7 inputs and 6 outputs, and any combination of inputs can feed any combination of outputs. Patch routings can be memorized and recalled at the touch of a button, or with MIDI program change. Each input has an adjustable trim. This is the perfect add-on for home recording systems.

Basic Specifications & Suggested List Price: 19" rack-mountable/1U; 7-input/6-output; MIDI In, Out, Thru, 32 programmable banks; trim control: 0 to -24 dBm, off; input impedance: 47k ohms; output impedance: 600 ohms; frequency response: 20-20k Hz. \$399.95.

AKG ACOUSTICS, INC.
77 Selleck St.
Stamford, CT 06902
(203) 348-2121

Product Name: AKG DSP 610 Delta Stereophony System

Contact: Dave Ogden, sales manager

Date Product Introduced: 1987

Product Description & Applications: Delta Stereo is a new system designed to produce congruent visual and acoustic perceptions in large sound reinforcement situations. Used in conjunction with a loudspeaker system specifically distributed over the listening area, the DSP 610 will digitally matrix 6 input signals for correct localization, and will follow moving voices on stage. A correct stereo picture for every seat in the house is provided, as well as equal amplitude level.

Basic Specifications & Suggested List Price: The DSP 610 features six inputs with adjustable delay times (there are also four auxiliary, non-delayed inputs). The ten outputs each have level indication and attenuation. The DSP 610 is controlled by an IBM AT or compatible computer via the RS-232 interface. All signals are digitally processed to preserve wide dynamic range and top-grade sound quality. Pro user net price is \$1,195.

AKG ACOUSTICS, INC.
77 Selleck St.
Stamford, CT 06902
(203) 348-2121

Product Name: ADR 68K Digital Reverb & Effects Device Version 4 Software

Contact: Dave Ogden, sales manager

Date Product Introduced: October, 1987

Product Description & Applications: Version 4 software for the ADR 68K Digital Reverb & Effects Unit will provide: 32 seconds of sampling, with as many as 8 independent samples, triggerable simultaneously and individually. Sample data dump via MIDI-on to the Macintosh or the PC. Pitch shift +/- 1-octave on samples. Parameter control via MIDI, available for all programs, with all parameters available for control and up to ten moving simultaneously. More split programs, with increased control including size adjustments and gates. Various user selectable effect and reverb combinations, including DDL, chorus, flange, multi-tap delay and parametric EQ, either available in chains or as independent mono-in/stereo-out programs. A 28-second tape loop program, and more.

Basic Specifications & Suggested List Price: The ADR 68K is a digital reverb and effects device, fully software based. Two inputs and 4 outputs are provided. The remote control features all parameters available on soft slide control, with a large 160-character display for maximum visibility. An internal help feature increases the user friendly aspect of the machine. Pro user net price is \$4,995.

ALESIS CORPORATION
7336 Hinds Ave.
North Hollywood, CA 91605
(213) 467-8000

Product Name: Micro Series

Contact: Allen Wald, vice president, marketing

Date Product Introduced: 1987

Product Description & Applications: The Alesis Micro Series is a professional signal processing system based on a modular, extruded aluminum, rack mountable case design. Current products in the line include Microverb, Microgate, Micro Limit-

—CONTINUED ON PAGE 270

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er and Micro Enhancer. Each unit features professional specs and is designed for the ultimate in user-friendliness. All units are full stereo and are rack mountable in groups of three in the Alesis Micro Rack. Applications range from the home personal use studio to professional record production, sound reinforcement, installation, film and video post and broadcast.

Basic Specifications & Suggested List Price: Microverb: 10kHz bandwidth, 90 dB dynamic range, 16 digital reverb programs, \$249. Micro Gate: threshold, delay, rate controls, defeat switch, 20kHz bandwidth, \$125. Micro Limiter: input, release, output controls, defeat switch, 20kHz bandwidth, \$125. Micro Enhancer: threshold, mix, bandwidth controls, defeat switch, 20kHz bandwidth, \$125.

ALESIS CORPORATION
7336 Hinds Ave.
North Hollywood, CA 91605
(213) 467-8000

Product Name: MIDverb II
Contact: Allen Wald, vice president, marketing
Product Description & Applications: MIDverb II is a full 16-bit linear PCM stereo digital effects processor featuring 99 programs with full 15kHz bandwidth. Programs include 29 natural reverb, 10 gated reverb, 10 reverse reverb, 10 chorus, 10 flange, 20 delays and 10 special effects. An Alesis designed VLSI signal processing microchip is the heart of the unit. Manual or MIDI program change directly or via 32 user-storable patch locations. Applications range from home studio to full professional record production, sound reinforcement, broadcast, post and installation.

Basic Specifications & Suggested List Price: 99 programs, 16-bit linear PCM, 15kHz bandwidth. Stereo in and out, -10 to +4 dBV levels. 1/4" phone jacks. MIDI mapping of 32 patch changes. Processor speed: eight million operations per second. 19" rack mount case. MIDI In and Thru. Price: \$399.

AMR (AUDIO MEDIA RESEARCH)
PO Box 1230
Meridian, MS 39301
(601) 483-5372

Product Name: PME 4 Four-band Parametric Equalizer
Contact: Ken Valentine, product manager
Date Product Introduced: June, 1987

Product Description & Applications: Four bands of true parametric equalization with pinpoint accuracy over more than 11 octaves. Each of the four bands provide calibrated frequency adjustment, variable "Q" range of 1/6-octave to 2 full octaves and continuously variable, symmetrical 18 dB boost/cut. Besides the normal output, a special 40Hz, high-passed output is provided for live sound PA and musical instrument preamp applications.

Basic Specifications & Suggested List Price: 15Hz to 24kHz range of center frequencies, 18 dB boost/cut (symmetrical), +/-20 dB broadband gain control allows operation with a wide range of sources from instrument pick-ups to +4 dBV professional studio gear. Single space, 19" rack-mount chassis. Suggested U.S. list price: \$199.50.

AMR (AUDIO MEDIA RESEARCH)
PO Box 1230
Meridian, MS 39301
(601) 483-5372

Product Name: DSR 100 Digital Stereo Reverb/Multi-Effects Processor
Contact: Ken Valentine, product manager
Date Product Introduced: June, 1987

Product Description & Applications: The DSR 100 offers 50 MIDI selectable reverberation effects with a full range of room characteristics. There are also 50 delay-effect presets with user-programmable modulation rate and depth and delay time. In the delay modes, the delay time is independently variable for the left and right outputs. True stereo processing. Mono input signals are processed to stereo reverb outputs. All of the 100 effects may be mapped to any of 128 MIDI programs. Controls include input level, effect mix, output level. A matrix of 12 switches facilitates preset selection and programming functions.

Basic Specifications & Suggested List Price: 16-bit processing, wide-bandwidth 15kHz response, single space, 19" rack-mount chassis, MIDI selectable presets, programmable delay effects, combination effects such as pre-delay reverb, panning echo, delay times up to 2.5 seconds, reflections of 800-900 milliseconds, delay times of 20 to 30 seconds. Suggested U.S. list price: \$399.50.

AMR (AUDIO MEDIA RESEARCH)
PO Box 1230
Meridian, MS 39301
(601) 483-5372

Product Name: NGT 2 Dual Channel Noise Gate
Contact: Ken Valentine, product manager
Date Product Introduced: June, 1987

Product Description & Applications: Two independent noise gate channels with full gate parameter control and push-button "Link" selection. Both channels offer continuously vari-

NEW PRODUCTS

SIGNAL PROCESSING DEVICES

1988

able control of threshold, attenuation, attack and release time as well as front panel bypass switches. Side chain input/insert capability is provided and each channel features an RCA "trigger" output for triggering external devices such as electronic drum machines, etc. The NGT 2 is packaged in a single space 19" rack-mount chassis.
Basic Specifications & Suggested List Price: Suggested U.S. list price: \$199.50.

AMR (AUDIO MEDIA RESEARCH)
PO Box 1230
Meridian, MS 39301
(601) 483-5372

Product Name: CDS 2 Dual Channel Compressor/Limiter/De-esser

Contact: Ken Valentine, product manager
Date Product Introduced: June, 1987

Product Description & Applications: Two channels of "soft-knee" compression and independent de-essing. Controls offer ease of adjustment and easily repeatable settings. Channels may be linked for stereo mode operation by simply depressing the front panel "Link" button (no re-patching necessary). Both channels feature front panel bypass switches as well as side chain input/insert capability. The CDS 2 is packaged in a single space 19" rack-mount chassis.
Basic Specifications & Suggested List Price: Suggested U.S. list price: \$199.50.



ANT TELECOMMUNICATIONS INC.
Telcom c4 Noise Reduction System E413

ANT TELECOMMUNICATIONS INC.
1211 Village Lake Dr.
Davidsonville, MD 21035
(301) 670-9777

Product Name: Telcom c4 Noise Reduction System E413
Contact: Rick Matter, sales manager
Date Product Introduced: October 16, 1987

Product Description & Applications: The E413 is designed to improve the quality of 24-track analog or digital tape recordings. As with all the telcom c4 noise reduction systems the E413 provides a pure, clean, natural sound with no breathing or pumping, no over-shooting, no dynamic faults or distortion, reduced pre- and post-echo, reduced modulation noise, improved crosstalk, increased headroom, a gain in dynamic range of up to 40 dB and operates independently of level alignments.

Basic Specifications & Suggested List Price: Suggested price \$17,860. The system utilizes a 4-band splitting compander with a frequency response of -2 dB from 20Hz to 25kHz. Harmonic distortion is less than or equal to 0.2% (30Hz: less than or equal to 0.5). The gain in dynamic range is up to 39 dB (with 1.5 dB linear compander slope) with a 115 dB overall dynamic range RMS, A-weighted.

APHEX SYSTEMS, LTD.
13340 Satcoy St.
North Hollywood, CA 91605
(818) 765-2212

Product Name: ESP-7000 Surround Sound Decoder
Contact: Deirdre Hill, sales
Date Product Introduced: January, 1987

Product Description & Applications: The ESP-7000 provides

up to 6 channels of surround sound plus subwoofer from any encoded or non-encoded stereo source. Fully compatible with Dolby stereo, ultra stereo and other surround modes. The ESP-7000 is ideal for sophisticated home systems, nightclubs, theaters and screening rooms. New vector cancellation circuits provide up to 50 dB of adjacent channel separation!
Basic Specifications & Suggested List Price: Freq. response: 12Hz-50kHz +0, -1 dB, THD: 0.3%; dynamic range: 96 dB; size: 1.75"H x 17"W x 9"D (rack-mountable), retail price: \$995.

APHEX SYSTEMS, LTD.
13340 Satcoy St.
North Hollywood, CA 91605
(818) 765-2212

Product Name: Aural Exciter Type E®
Contact: Paula Lintz, sales

Date Product Introduced: June, 1987

Product Description & Applications: The new Type E Aural Exciter restores natural sounding brightness and presence to any audio program. It has instrument level I/O as well as line level. The Type E is particularly well suited for use with guitars, basses, keyboards and drum machines. It is 1/2-rack size and has a footswitch jack for remote on/off.
Basic Specifications & Suggested List Price: Frequency response: +0, -1/2 dB 10Hz-30kHz; THD (mix at minimum): .001%; hum and noise: inst. level -116 dBu; size: 1.75"H x 8.25"W x 7.25"D; AC powered, suggested list: \$199.

ART—APPLIED RESEARCH & TECHNOLOGY, INC.
215 Tremont St.
Rochester, NY 14608
(716) 436-2720

Product Name: IEQ Intelligent Equalizer with Smartcurve™
Contact: Pete Beverage, vice pres., sales

Date Product Introduced: June, 1987

Product Description & Applications: Fully programmable, digitally controlled, 120 memories. Smartcurve eliminates adjacent frequency filter interaction. Superior audio performance. Controller will operate up to 15 satellites. Complete MIDI interface. Video output. Applications include studios: recall presets for client/mix etc., control multiple EQs, MIDI studio follow MIDI program changes with ease. Tweak sound of each synthesizer patch; live use with MIDI instruments. Unit is durable for sound reinforcement and touring.
Basic Specifications & Suggested List Price: 2/3-octave, iso centers; 1/3-octave available later in the year. Balanced input and output. Signal-to-noise and dynamic range greater than 100 dB THD less than 0.09%. Unit is under software control which is updatable. Lithium cell battery back-up provided. Controller retail \$595, satellite retail \$395.

AUDIO/DIGITAL, INC.
1000 S. Bertelsen Rd., Ste. 4
Eugene, OR 97402
(503) 687-8412
(800) 423-1082

Product Name: ADD-3PG Industrial Digital Processor
Contact: Gary Hardesty, director of engineering
Date Product Introduced: July 1, 1987

Product Description & Applications: Model ADD-3PG will store four "pages" of information for later remote recall. The "page" mode allows you to store three channels of delay times and digital attenuation on each of the four individual "pages." Each "page" can be remotely recalled with a simple 3-wire binary interface (1 ground, 2 bits). Multiple ADD-3PGs can be hooked in parallel on this "page" bus, remote activation causes a simultaneous "page" change to all delays. Upon a "page" change, the delay will echo the chosen "page" number on the display.

Basic Specifications & Suggested List Price: 0- to 490-millisecond delay in 1 ms steps; 20Hz-20kHz frequency response; 16-bit linear PCM; less than 0.08% THD + noise; 90 dB dynamic range; active balanced in/out, alphanumeric display; security mode, optional Jensen transformers available; XLR connectors, one rack space, features a remote "page" control and digital output control.

AUDIO/DIGITAL, INC.
1000 S. Bertelsen Rd., Ste. 4
Eugene, OR 97402
(503) 687-8412
(800) 423-1082

Product Name: ADD-3US Industrial Digital Processor
Contact: Gary Hardesty, director of engineering
Date Product Introduced: July 1, 1987

Product Description & Applications: Model ADD-3US features simultaneous microsecond/millisecond operation. Microsecond mode steps in 15 μs increments; millisecond mode steps in 1 ms increments. Maximum delay time is 481 ms. The ADD-3US offers the user the ability to program in any combination of μs/ms steps and stores all settings in nonvolatile memory.

Basic Specifications & Suggested List Price: 0- to 481-millisecond delay in 1 ms steps; 15- to 9,990-microsecond delay in 15 μs steps; 20Hz-20kHz frequency response, 16-bit linear PCM; less than 0.08% THD + noise; 90 dB dynamic range;

active balanced in/out, alphanumeric display; security mode; optional Jensen transformers available; XLR connectors; one rack space; features simultaneous microsecond/millisecond operation.

AUDIO LOGIC
5639 S. Riley Lane
Salt Lake City, UT 84107
(801) 268-8400
(801) 262-4966 FAX

Product Name: SC-31, 31-Band 1/3-Octave Graphic Equalizer
Contact: Dean Stubbs, marketing communications manager
Date Product Introduced: July, 1987

Product Description & Applications: The Audio Logic SC 31 single-channel graphic equalizer offering 31 bands of 1/3-octave-centered equalization. The equalizer offers a selectable 6 dB or 12 dB of boost and cut. The equalizer is a computer-optimized VCVS band-pass filter design with the Q selected for minimum ripple in amplitude and phase response, giving the unit a more natural feel and sonic accuracy—improved over other similar constant Q designs. The unit offers Cannon XLR type connectors, a barrier strip and -inch tip-ring-sleeve phone jacks, for connection to any type of balanced or unbalanced audio system.

Basic Specifications & Suggested List Price: 31 1/3-octave center bands, switchable and adjustable high- and low-pass filters, delayed audio turn on, maximum output level is 27 dBm, dynamic range is 121 dBm, +/-6 or +/-12 dB ranges, THD + noise is .004% at 1 kHz, signal-to-noise ratio is +94 dB below 0. Made in the USA Suggested list price is \$499.

BARCUS-BERRY ELECTRONICS, INC.
5500 Bolsa Ave., #245
Huntington Beach, CA 92649
(714) 897-6766

Product Name: BBE 802
Contact: Jennifer Drescher, operations mgr.
Date Product Introduced: October, 1986

Product Description & Applications: The BBE 802 compensates for phase and amplitude distortion inherent in sound systems. It results in cleaner highs, improved image, presence and detail. Used in broadcast for live on-air and cart preparation. Recording studio applications include input demands for individual racks, final mixdown and mastering. Used in live concert to add liveliness and detail to monitor mix. Movie theater sound is enhanced. Voice intelligibility is improved.

Basic Specifications & Suggested List Price: The 802 is used in balanced professional line levels applications. It occupies one standard EIA rack space. Noise in process mode is -90 dBu below a 0 dBu output level. The THD is less than 0.15% at 1 kHz with +4 dBu in. The output can deliver +24 dBu into 600 ohms before clipping. List is \$499.

BARCUS-BERRY ELECTRONICS, INC.
5500 Bolsa Ave., #245
Huntington Beach, CA 92649
(714) 897-6766

Product Name: BBE 401
Contact: Jennifer Drescher, operations mgr.
Date Product Introduced: September 30, 1987

Product Description & Applications: BBE 401 is a single channel version of the patented BBE system. BBE compensates for phase and amplitude distortion in sound systems. The 401 is designed for use with microphones for vocalists, soloists, podium microphones and PA systems. Detail, presence, image and texture are improved. A more complete and accurate reproduction of the live performance is achieved without adding artificial harmonics. Voice intelligibility is improved.

Basic Specifications & Suggested List Price: The 401 is a single channel unit that enhances low level or line level applications. Total harmonic distortion is below 0.1% at 1 kHz with -10 dBu in. Noise is less than -85 dBu with gain control at maximum. Phantom power is provided so that you may use a condenser microphone. List is \$229.

BRYSTONVERMONT LIMITED
RFD #4, Box 2255
Montpelier, VT 05602
(802) 223-6159
(800) 451-4160

Product Name: Bryston 10B Electronic Crossover
Contact: John Day Russell, president
Date Product Introduced: October, 1987

Product Description & Applications: Professional crossover with wide flexibility, 2-way stereo and 3-way mono operation. 12 crossover points for separate low pass and high pass, and separate 6, 12 or 18 dB slopes, or separate 12 or 24 dB slopes. Low pass +/-5 dB gain control.

Basic Specifications & Suggested List Price: 19" W x 1.75" H x 10" D. Weight 9 pounds. Price not available yet.

What do the 224XL, 480L, RMX-16 and QRS have in common?



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#863,
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Circle #212 on Reader Service Card

BSS

30 B Banfi Plaza N.
Farmingdale, NY 11735
(516) 249-3660

Product Name: BSS DPR-502 Dual-Channel Noise Gate
Contact: Harry Klane, sales

Date Product Introduced: August, 1987

Product Description & Applications: This 1 75" unit's user-controlled parameters include a fully parametric key filter, threshold, range, attack, release and hold. The unique features include auto-attack, velocity-sensitive MIDI, test open (forces gate open for setup, etc.) and audio dynamic enhancement (ADE) (emphasizes the leading edge of the signal for extra punch and attack). Stereo link, an internal barrier strip for secondary functions, +20 dB key level meter, VCA control, key listen and key gain make this gate easier to use.
Basic Specifications & Suggested List Price: +20 dB into 10k ohms electronically balanced input, +20 dBV unbalanced output to drive 600 ohms, key filter fully variable Bell response from 100Hz to 10kHz, bandwidth 3 to 10 octaves, threshold +20 dBV to -50 dBV, attack 10µs to 1 sec., plus auto, release 1ms to 10 sec., range 5 dB to 70 dB. Price TBA

BSS

30 B Banfi Plaza N.
Farmingdale, NY 11735
(516) 249-3660

Product Name: BSS MSR-604 Mic Splitter w/MSR-602 PSU
Contact: Harry Klane, sales

Date Product Introduced: April, 1987

Product Description & Applications: Each single rack space unit contains (4) 1 x 4 splitters. Each splitter has an electronically balanced mic input which is split into two transformer balanced and two electronically balanced (optional transformer) outputs. Phantom power and 6 dB of gain are individually switchable on each section and the gain switch can be remotely controlled from the mixer. The single space PSU can power (10) MSR-604 making 40 x 160 the maximum configuration per PSU. The PSUs can be cascaded.
Basic Specifications & Suggested List Price: Dual gain modes selected by remote or local switching provides +4 dB or +14 dB through gain, input to any output +6 dBV or -4 dBV input headroom across 1k input impedance, -10 dBV or -116 dBV equivalent input noise, wide band, 200-ohm source imp +10 dBV maximum output level into 600 ohms. Price TBA

CALIBRATION STANDARD INSTRUMENTS

PO Box 2727
Oakland, CA 94602
(415) 531-8725

Product Name: LHE-2C
Contact: Edward M. Long, owner

Date Product Introduced: July, 1987

Product Description & Applications: The LHE-2C is a dual channel signal processor which functions as an electronic crossover without the usual time delay. The low frequency sections use the patented ELF™ technology plus two dynamic range controls. The high pass frequencies are switch selectable. The low pass frequency is selected by adjusting the resonance of the bass enclosures. Because ELF™ causes the bass speakers to operate below resonance, effects of amplifier damping and cable resistance are negligible.
Basic Specifications & Suggested List Price: High pass filter selectable 70 to 200Hz, distortion less than 0.2%, low pass filter 30Hz to bass system resonance, signal to noise 92 dB, time offset 50 to 500 microseconds, sensitivity 0.5 VRMS, input impedance 10K ohms unbal 20K ohms bal., output level 2 VRMS, output impedance 2K ohms unbal 600 ohms bal., internal adjustments 30

CALIBRATION STANDARD INSTRUMENTS

PO Box 2727
Oakland, CA 94602
(415) 531-8725

Product Name: LHE-1C
Contact: Edward M. Long, owner

Date Product Introduced: July, 1987

Product Description & Applications: The LHE-1C is a single channel signal processor which functions as an electronic crossover without the usual time delay. The low frequency section uses the patented ELF™ technology plus a dynamic range control. The high pass filter frequency is switch selectable. The low pass frequency is selected by adjusting the resonance of the bass enclosure. Because ELF™ causes the bass speaker to operate below resonance, effects of amplifier damping and cable resistance are negligible.
Basic Specifications & Suggested List Price: High pass filter: selectable 70 to 200Hz, distortion: less than 0.2%; low pass filter: 30Hz to bass system resonance, signal to noise: 92 dB, time offset: 50 to 500 microseconds; sensitivity: 0.5 VRMS; input impedance: 10K ohms unbal 20K ohms bal., output level 2 VRMS, output impedance: 2K ohms unbal 600 ohms bal., internal adjustments: 15

CARVIN CORP.
1155 Industrial Ave.
Escondido, CA 92025

NEW PRODUCTS**SIGNAL PROCESSING DEVICES**

1988

(619) 747-1710

Product Name: EQ 2029

Contact: Neal Taylor, sales manager

Date Product Introduced: December, 1986

Product Description & Applications: Professional 1/3-octave graphic equalizer

Basic Specifications & Suggested List Price: 29 boost/cut filters +/-15 dB Harmonic dist < 0.1% 20 to 20kHz S/N 104 dB Balanced and unbalanced in/out 18 dB per octave hi/lo cut filters at 20Hz and 20kHz Slew rate 9 volts per micro-second

CIRCUIT DESIGN TECHNOLOGY, INC.

26801 Richmond Rd.
Bedford Heights, OH 44146
(216) 292-0491

Product Name: PF-8 Polyframe Series 1000

Contact: Bruce Forbes, marketing mgr

Date Product Introduced: June, 1987

Product Description & Applications: 8-channel modular signal processing rack, featuring a variety of modules: 1002 compressor/limiter/gate, 1003 Dynex dynamic expander 1004 dual threshold gate—Downward expander, 1005 spectral recovery system, 1006 parameter variable crossover, 1007 mic preamp 1008 ratio metric de-esser, 1009 parametric limiter

Basic Specifications & Suggested List Price: THD better than 0.2%, noise better than -90 dB (ref 774v = 0 dBm), bandwidth 20Hz-20kHz, RMS converter range 10 dB, VCA control range 106 dB, total dynamic range 114 dB



CLARITY
XLV

CLARITY

Nelson Lane
Garrison, NY 10524
(914) 424-4071

Product Name: XLV

Contact: Gregory Kramer

Date Product Introduced: October, 1986 Updated June, 1987

Product Description & Applications: The Clarity XLV is an effects automation interface. Using MIDI as the automation protocol, it allows control of all parameters of the Lexicon 224XL and 480L, AMS rmx-16, Quantec room simulator and Yamaha REV-1. With eight channels of MIDI to control voltage conversion, it allows automation of digital delay lines, VCA-based processors, analog synths and other devices. Originally released for the 224XL and 480L, the rmx-16 and QRS updates make the XLV essential to any truly automated facility and any professional studio that is strong in MIDI.

Basic Specifications & Suggested List Price: MIDI inputs and outputs, RS-422 in and out for the Lexicon and RS-232 outputs for AMS, Quantec and Yamaha units. Eight control voltage outputs, 0 to +10 volts. Very complete MIDI implementation. Ability to scale MIDI data and send to any parameters of the processors. Scaling factors include full and inverse by percentage, keyboard re-scale, trigger, log, antilog and others. LARC ladder movements translated to MIDI for from-the-LARC automation. Price: \$1,295

COMPTON ELECTRONICS/DIV. OF LP MUSIC GROUP
160 Belmont Ave.
Garfield, NJ 07026
(201) 478-6903

Product Name: Compton Impedance/Plug Matching Box
Contact: George Rose, sales mgr

Date Product Introduced: August, 1987

Product Description & Applications: The Compton C1425 Impedance/Plug Matching Box is a dual channel adapter which can convert any input jack configuration to any output jack configuration. A choice of XLR, 1/4" phone, stereo 1/4" phone and RCA plugs are available for both inputs and outputs. Impedance matching options: low in/low out (left and right), low in/high out (left and right), high in/high out (left and right), high in/low out (left and right).

Basic Specifications & Suggested List Price: C1425 suggested retail \$99.95

DBX

71 Chapel St.
Newton, MA 02195
(617) 964-3210

Product Name: 929 Module, Single-Ended Noise Reduction

Contact: John Sternberg, pro NSM

Date Product Introduced: July, 1987

Product Description & Applications: Contains two channels of single-ended, one-step noise reduction for sources that have a continuous, unchanging hiss "floor" beneath the desired signal. Properly set, the 929 reduces or eliminates the hiss with little or no sacrifice of musical high frequencies and treble overtones. A knob governs the total amount of hiss removal. This multi-function control sets the frequency-sensitivity threshold and gauges the overall level of noise reduction. The design is not intended to remove ticks and pops or to attack modulated or changing hiss, nor to quiet hum or material that has been dynamically processed. Constant audio and videotape hiss is a main target of the dbx 929. There are also applications for equipment and broadcasting/reception cleanup.

Basic Specifications & Suggested List Price: \$600

DIGITECH

5639 S. Riley Ln.
Salt Lake City, UT 84107
(801) 268-8400

Product Name: DSP-128 Digital Signal Processor

Contact: Dean Stubbs, marketing communications manager

Date Product Introduced: July, 1987

Product Description & Applications: The DSP-128 is a MIDI controllable, multi-effect digital signal processor with 128 presets. The Digital Effects Signal Processor offers reverberation effects, chorusing, flanging and delays, and can do more than one effect at the same time. The DSP-128 comes ready programmed with 128 effects derived from 32 main effect algorithms. Operating parameters of these main algorithms may be changed by the user and stored in any one of the 128 memory positions. Memory settings are backed up by battery.

Basic Specifications & Suggested List Price: MIDI In and MIDI Thru jacks, maximum signal to quiescent noise floor 96 dB, signal to noise ratio 72 dB, dynamic range 75 dB, number of presets 128, made in the USA, suggested list price is \$399.95

DREW ENGINEERING COMPANY

35 Indiana St.
Rochester, NY 14609
(716) 544-3337

Product Name: Genesis Dynamics Processor

Contact: Joseph Barone, customer service

Date Product Introduced: September 15, 1987

Product Description & Applications: Genesis is a full-featured digital dynamics processor with an extraordinary 20-bit dynamic range. It is stereo, MIDI and fully programmable. Included are 100 digital simulations of popular dynamics processors and 100 stored shapes. Plus you can design your own process and sample or draw shapes. An infinite number of programs can be stored on credit card memory modules.
Basic Specifications & Suggested List Price: 20-bit stereo digital signal processor Bandwidth: 35kHz, S/N ratio 102 dB, THD less than 0.05%, slew rate: 9 volts/microsecond, backlit display and video monitor, full parameter control, MIDI \$9,800

ELECTROSPACE DEVELOPMENTS

21213 B Hawthorne Blvd., Ste. 5086
Torrance, CA 90509
(213) 373-1009

Product Name: EX-1

Date Product Introduced: May, 1987

Product Description & Applications: The EX-1 is a 2-channel compressor with an up and down ratio expander section. A corner frequency de-esser and peak limiter section add to the features of this exciting new product. Capable of gating and ducking, the EX-1 can use all of its features simultaneously making this product very useful in the studio and sound reinforcement as well.

Basic Specifications & Suggested List Price: List price \$650 Impedance: 20k ohms, balanced, bandwidth 20Hz to 20kHz +/-1 dB, max output level +21 dBm unbalanced, +24 dBm balanced, outputs: balanced with autosensting to gain compensate for unbalanced, noise -92 dBm to -35 dBm variable, distortion: 0.3 at unity gain.

EVENTIDE, INC.

1 Alsan Way
Little Ferry, NJ 07643
(201) 641-1200

Product Name: PD 860 Precision Audio Delay

Contact: Gil Griffith, sales manager

Date Product Introduced: April 1, 1987

Product Description & Applications: 2-channel precision delay with user-selectable delay increments of one microsecond. Ideal for AM broadcast synchronous transmission, acoustic research, speaker array time aligning, audio delay compensation for satellite path and video effects devices, lab and test functions, or anywhere an ultra-precise, ultra-high audio quality audio delay is required.

Basic Specifications & Suggested List Price: Min. delay 150 microseconds, max. delay 52 seconds, freq. response 5Hz-20kHz +/-1 dB, dynamic range: greater than 90 dB, distortion: less than 0.02% at 1kHz, channel separation: 80 dB at 1kHz, sampling rate: 16 bits/channel at 62.5kHz, input level: balanced 4.7k ohm impedance, selectable +4 or -10 dBm; output level: 600 ohms, electronically balanced +20 dBm

EVENTIDE, INC.

1 Alsan Way
Little Ferry, NJ 07643
(201) 641-1200

Contact: Gil Griffith, sales manager

Product Description & Applications: Eventide will introduce a major new product which will be made public for the first time at the AES, October 1987.

FM ACOUSTICS LTD. (USA)

PO Box 854
Benicia, CA 94510
(707) 745-4444

Product Name: FM 214 Precision Balanced Line Driver

Contact: Gene Michalski

Date Product Introduced: January, 1987 (AES London)

Product Description & Applications: The FM 214 is a precision device designed and built to meet the most critical professional interface need. Its totally discrete, class A design insures that the unbalanced -10 dB signal of consumer and semi-professional equipment will remain completely accurate when interfaced with professional balanced equipment operating at levels of +4 dB.

Basic Specifications & Suggested List Price: Class A technology, no transformers or ICs in the audio path, delayed turn-on,

50-ohm input impedance, recessed front panel gain control from -70 dB to +14 dB, separate power supply, absolute stability, short circuit proof outputs, price \$820.

FOCUSRITE, U.S. LTD.

1100 Wheaton Oaks Ct.
Wheaton, IL 60187

(312) 653-4544

Product Name: Focusrite, Input Signal Amplifier 113 & 116

Contact: Dan Zimbelman, president

Date Product Introduced: August, 1987

Product Description & Applications: A microphone amplifier-only version of the already well-known Focusrite ISA technology. The ISA 113 is supplied in a 3 1/2" x 19" rack-mountable frame housing main and phantom power supplies. Up to 12 ISA 113s may be housed in the standard frame. The ISA 116 is a remote controlled version of the 113 allowing for the preamp to be near the source for significantly improved sonic performance. Twelve ISA 116 modules may be housed in the standard frame size 5 1/4" x 19".

Basic Specifications & Suggested List Price: Focusrite ISA modules have a warm sound and are easy to use. It has been said that "the sound of the '70s is back." The present ISAs outperform anything produced up until now and open up a prophetic vista of the '90s. ISA 113 list price \$660. ISA 116 list price \$770. Main frame rack for above, including main and 48v power supplies: price \$1,500.

FOCUSRITE, U.S. LTD.

1100 Wheaton Oaks Ct.
Wheaton, IL 60187

(312) 653-4544

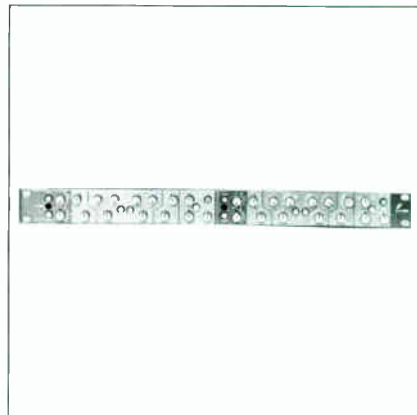
Product Name: Focusrite ISA 115 HD

Contact: Dan Zimbelman, president

Date Product Introduced: April, 1987

Product Description & Applications: A dual channel horizontal version of the acclaimed Focusrite microphone amplifier/equalizer package. The ISA 115 HD includes all functions of the original 110 module including microphone/line input, 2 bands of fully parametric EQ, 2 bands shelving equalizer and hi and lo steep filters. The package is 1 3/4" x 19" rack mountable with XLR connectors on the rear panel for audio termination. An additional 1 3/4" x 19" unit houses the main power supply and a 48V phantom supply.

Basic Specifications & Suggested List Price: Focusrite ISA modules have a warm sound and are easy to use. It has been said that "the sound of the '70s is back." The present ISA's



FOCUSRITE, U.S. LTD.
Focusrite ISA 115 HD

outperform anything produced up until now and open up a prophetic vista of the '90s. ISA 115 HD list price: \$5,100

FURMAN SOUND, INC.

30 Rich St.
Greenbrae, CA 94904
(415) 927-1225

Product Name: LC-6 Stereo Limiter/Compressor/Gate

Contact: Joe Desmond, national sales manager

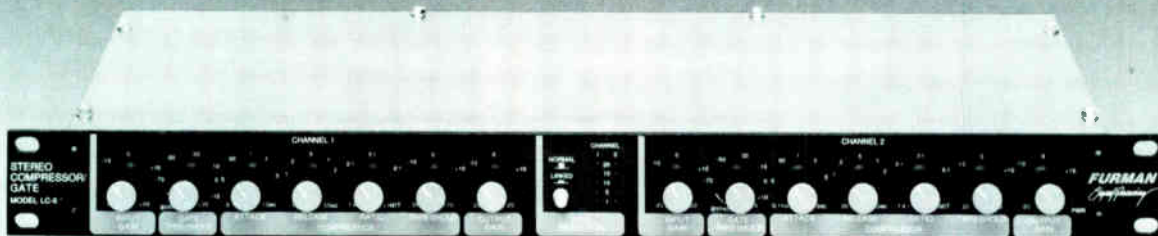
Date Product Introduced: June 27, 1987

Product Description & Applications: The LC-6 is comprised of two independent limiter/compressor/noise gate channels. Each compress section has attack, release, threshold and ratio controls, each gate section has its own threshold control. Both sections may be used simultaneously, and both channels may be linked for stereo via a front panel switch. Other features include input and output controls, side chain in and out jacks, five segment LED meters and ground lift switches. Available in an optional balanced configuration with XLR connectors.

Basic Specifications & Suggested List Price: Noise: -92 dBV.

—CONTINUED ON NEXT PAGE

COMPRESS, WHILE YOU GATE



Have it both ways, all at once—and in stereo, too. The new Furman Sound LC-6 Stereo Compressor/Gate gives you two limiter/compressor/noise gates in one compact package which may be used independently or linked for stereo via a pushbutton switch. Each channel has a complement of seven controls and a bar-graph LED meter. All controls are directly calibrated in decibels, milliseconds, or other precise units. The Compress section features Threshold, Attack, Release, and Ratio; the Gate section has its own Threshold control. Input and Output Gain are common to both sections.

With the LC-6, you can compress or limit the loud portions of your program, while you expand the quieter portions, keeping a tight rein on both distortion and noise.

The LC-6. Another Problem Solver from Furman.

And be sure to check out the other products in Furman's complete line of dynamic range modifiers. There's the top of the line LC-X, which lets you expand, compress, and limit, all simultaneously; there's the economy LC-3A Limiter/Compressor; and there's the QN-4A Quadruple Noise Gate, one of the most powerful weapons in any engineer's arsenal against noise, buzz, mic leakage, and feedback.

Call or write for more information.

Furman Sound, Inc.
30 Rich Street
Greenbrae, California 94904
Phone: (415) 927-1225
Telex: 425900

FURMAN
Signal Processing

unweighted, 20Hz to 20kHz, distortion less than .008% THD, 20Hz to 20kHz, no limiting; less than 1% THD while limiting; attack time 100 μ sec to 1 sec, release time .05 to 5 sec; threshold: -20 dBV to +20 dBV; ratio 1.4:1 to greater than 50:1 Gate section's attack time fixed at less than 1 mSec, release time 250 mSec, threshold -70 to +20 dBV. Suggested list price \$419

GAINES AUDIO

1237 E. Main St.
Rochester, NY 14609
(716) 266-0780

Product Name: MP-1 Microphone Preamp

Contact: Jon Gaines, owner

Date Product Introduced: May, 1987

Product Description & Applications: High quality, low noise microphone preamp featuring the Jensen JE-115K-E input transformer, 70 dB of gain, switchable pad, packaged in a "half-rack" steel chassis.

Basic Specifications & Suggested List Price: \$179.50 factory direct



GOLD LINE
Crossovers with Built-in Limiters

GOLD LINE

PO Box 115
W. Redding, CT 06896
(203) 938-2588

Product Name: Crossovers with Built-in Limiters

Contact: Marj Miller, sales mgr.

Date Product Introduced: April, 1987

Product Description & Applications: Crossovers with Built-in Limiters Models 603MP and 602SP. Two new crossovers are now available in a single rack space configuration designed to be installed where limiter protection is a must. These units are supplied with recessed controls and security plates. They have been designed for audio excellence at an affordable price.

Basic Specifications & Suggested List Price: Model 602SP (2-way stereo with limiters) lists for \$505. Model 603MP (3-way mono with limiters) lists for \$425. Models 602SP and 603MP feature 24 dB Linkwitz-Riley slopes, electronically balanced inputs and outputs, recessed front panel controls with free security panels. The limiters have been placed in the optimum filter path to insure against frequency shift or distortion. Attack and release times have been tailored for each frequency to insure audio excellence.

GOTHAM AUDIO CORPORATION

1790 Broadway
New York, NY 10019
(212) 765-3410

Product Name: Harmonia Mundi Acustica BW 102

Contact: Russell O Hamm, president

Date Product Introduced: July, 1987

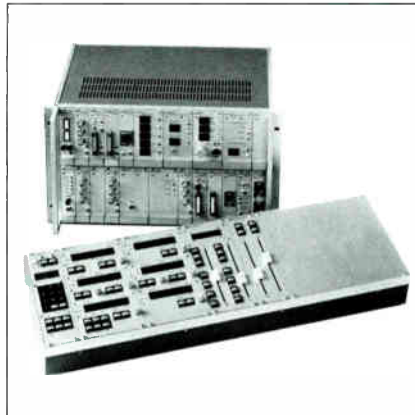
Product Description & Applications: Digital interface system with signal processing and 6-band parametric equalizer. Interfaces available for most digital formats including Sony 1630, Mitsubishi X-86, JVC 900, etc. Equalizer utilizes powerful DSP 32 signal processor developed by Bell Laboratories. Floating point calculations yield internal dynamic range of 500 dB. System also includes 4-channel digital mixer which interfaces to external devices in the digital domain.

Basic Specifications & Suggested List Price: DSP 2 processor module, 24-bit parallel input/output to HMA bus, internal processing 32-bit floating point. Control via remote panel with rotary encoders and LCD display. Stereo or 2-channel control depending on options selected.

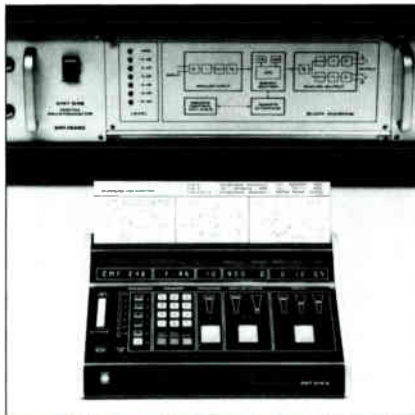
NEW PRODUCTS

SIGNAL PROCESSING DEVICES

1988



GOTHAM AUDIO CORPORATION
Harmonia Mundi Acustica BW 102



GOTHAM AUDIO CORPORATION
EMT 246

GOTHAM AUDIO CORPORATION

1790 Broadway
New York, NY 10019
(212) 765-3410

Product Name: EMT 246

Contact: Russell O Hamm, president

Date Product Introduced: March, 1987

Product Description & Applications: Digital reverberation system with rack mount processor and desktop remote control. Programs include delay, echo, non-linear and EMT 250. Three newly conceived reverberation programs utilize a unique algorithm for optimizing the eigen tone distribution. Program parameters are stored in memory with 99 user locations and 90 additional pre-programmed factory settings. The user memory is a plug-in cartridge which enables each engineer to retain unique settings. A special version with digital I/O is available.

Basic Specifications & Suggested List Price: Reverberation time 0.2 to 20 seconds, pre-delay 0 to 999 milliseconds, sampling frequency 26.4kHz, A/D conversion, 16-bit uniform; input electronically balanced, nominal level +6 dB, stereo output electronically balanced, impedance maximum 50 ohms, signal-to-noise ratio of reverb program 73 dB rms unweighted, price \$9,460.

INNOVATIVE AUDIO SYSTEMS

8101 Orion Ave., #19
Van Nuys, CA 91406
(818) 785-3428

Product Name: Tube Microphone Preamp, Model VTMP-2

Contact: James Demeter, owner

Date Product Introduced: April 15, 1987

Product Description & Applications: The Tube Microphone Preamp (VTMP-2) is a two-channel microphone preamplifier designed to give recording studios unsurpassed sound of

tube amplification in a package that easily interfaces with modern consoles, tape recorders, and is convenient to operate. The VTMP-2 employs Jensen JE 13K7A input transformers, polypropylene capacitors and metal film resistors. The power supply is fully regulated both in B+ (250 volts) and the filament voltage (12.6 volts) for low noise and quick flat response.

Basic Specifications & Suggested List Price: The VTMP-2 uses a classic tube design supported by the finest in modern components. Each channel of the VTMP-2 has variable gain of 30 to 50 dB, peak indicator, fader for level matching, 48-volt phantom power and selector switch for either microphone or musical instrument inputs. List price \$1,295.



INNOVATIVE AUDIO SYSTEMS
Tube Direct Box, Model VTDB-3

INNOVATIVE AUDIO SYSTEMS

8101 Orion Ave., #19
Van Nuys, CA 91406
(818) 785-3428

Product Name: Tube Direct Box, Model VTDB-3

Contact: James Demeter, owner

Date Product Introduced: April 15, 1987

Product Description & Applications: The Tube Direct Box is designed to interface musical instruments to the mixing console, without degrading or coloring the signal in any way. A vacuum tube design was chosen for the input stage because it produced the most accurate, natural sound of any device tested for this application. A Jensen output transformer provides complete ground isolation. The sonic excellence of tube microphones can now be found in the Tube Direct Box.

Basic Specifications & Suggested List Price: The Tube Direct Box offers a 10 dB boost switch, has a low impedance 200-volt B+ power supply, AC filament supply, 28-volt peak-to-peak headroom and input impedance of 27 megohms. Rugged anodized aluminum and steel chassis. List price of \$395. One-year warranty.



KINTEK, INC.
KT-904P Post-Production Stereo Converter

KINTEK, INC.
224 Calvary St.
Waltham, MA 02154
(617) 894-6111

Product Name: KT-904P Post-Production Stereo Converter

Contact: John J. Bubbers, product manager

Date Product Introduced: March, 1987

Product Description & Applications: The KT-904P is a fully integrated post-production mono to stereo converter. It adds

phase and amplitude cues from 20Hz to 20kHz to convert mono to stereo. When converting a composite mono track, it will dynamically center the dialog separately without affecting the acoustic width of the M&E track. It is intended to be used in making compatible stereo from mono tracks for final mix, or to upgrade mono mixes to stereo for TV or theater release.

Basic Specifications & Suggested List Price: The KT-904P is bridging impedance input, 600-ohm transformerless output. Max output level is +26 dBm, system gain 0 dB. Rack mounted, modular design modules permit system modifications to adapt to studio's individual needs. Remote controls for acoustic width and bypass switching. Suggested list price is \$4,995, FOB Waltham, MA.

KLARK-TEKNIK ELECTRONICS, INC.
30 B Banfi Plaza N.

Farmingdale, NY 11735
(516) 249-3660

Product Name: Klark-Teknik DN-405 Mono & DN410 Dual Channel Parametric EQ

Contact: Harry Klane, sales

Date Product Introduced: July, 1987

Product Description & Applications: A mono, one rackspace (405) and a two-channel, two-rackspace (410) with five full frequency bands per channel. Input gain, individual filter in/out switches as well as overall EQ in/out all w/LED status indication. XLR in and out, ground lift switch, fail-safe bypass and overload LED are standard. Security cover and transformer balancing are optional.

Basic Specifications & Suggested List Price: Gain: +16 to -20 dB, center frequency ranges: 20-200Hz, 200-2kHz and 2kHz to 20kHz yielding a control resolution of 10:1; bandwidth: 1/12th to 2 octaves, LF and HF cut filters are continuously variable between 15 and 300Hz and 2.5kHz and 30kHz at 12 dB/octave. Price TBA

KORG U.S.A. INC.

89 Frost St.
Westbury, NY 11590
(516) 333-9100

Product Name: DRV-3000 Dual Digital Effects Processor

Contact: Kim Holland, VP product development

Product Description & Applications: Korg's new DRV-3000 Dual Digital Effects Processor brings the convenience of wireless remote control to effects processing for the stage and studio. The unit's 16 effects programs include five reverbs, two early reflections, two echoes, auto pan, flange, chorus, ensemble (chorusing with a complex LFO modulation waveform) two pitch shift and a parametric EQ/driver program. The 16 factory presets may be edited by the user with the option to recall them from ROM at any time. Sixteen user programs are also included, for a total of 32 preprogrammed sounds.

Basic Specifications & Suggested List Price: DRV-3000 programs may be selected and edited from the wireless remote control. In addition, parameters and programs may be accessed and controlled via footswitches or MIDI. The DRV-3000's audio specifications meet the stringent standards of the modern recording environment. The effect signal frequency response is 20Hz-20kHz, with 94 dB dynamic range

LAKE PEOPLE

Rosgartenstr. 13
D-7750 Konstanz, Germany
Phone D (07531) 24428

Product Name: Deesser V4

Contact: Fried Reim, tech. director

Date Product Introduced: August, 1987

Product Description & Applications: The Deesser V4 was designed to solve all de-essing and limiting problems in audio, video, TV and film production studios. It contains a wide range adjustable compressor/limiter and a de-esser in one module. Gain reduction over 20 dB is displayed by 10 LEDs. The V4 comes modular to fit the Rack SR9 with space for nine modules in three units height or the Rack SR3 with space for three modules in one-unit height.

Basic Specifications & Suggested List Price: Input: electronic sym., impedance: 10 ohm sym-20k ohm asym., max. input level: 20 dBv, max. gain: 40; frequency range: 20Hz-20kHz; output: asym., max. output level: 20 dBv in RL > 600 ohm; distortion: < 0.5%, S/N: 80 dB; attack: 20-800 microsec.; decay: 50-1,000 millisecc., supply: +/-18 volt; dimensions: 40.3 x 129 x 160 or 129 x 44 x 160mm. Price \$498.

LP MUSIC GROUP

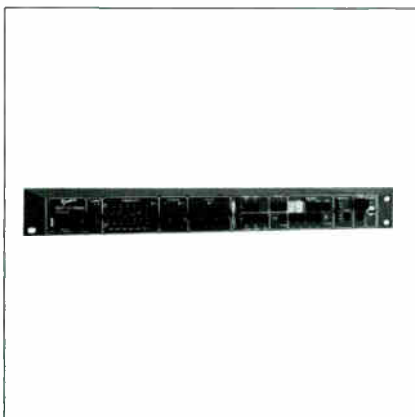
160 Belmont Ave.
Garfield, NJ 07026
(201) 478-6903

Product Name: Sound Studio 19

Contact: George Rose, sales manager

Date Product Introduced: June 27, 1987

Product Description & Applications: Sound Studio 19 combines a full complement of programmable guitar effects in a single space 19" rack mountable unit. It can store up to 100 different effect parameter combinations, including two external effects, recallable by hand or footswitch. Effects are adjustable, programmable and can be used simultaneously. Sound



LP MUSIC GROUP
Sound Studio 19

Studio 19 will drive any guitar amp, power amp, mixing board or headphones.

Basic Specifications & Suggested List Price: Effects include stereo chorus, stereo delay, distortion, 6-band equalizer, compression, two effects loops (stereo and mono) and A-440Hz tone generator. Retail price \$649.95

MRH AUDIO CONCEPTS

PO Box 339
Fox Lake, IL 60020

Product Name: CBK-2

Contact: Mark Hannemmer, owner

Date Product Introduced: June 1, 1987

Product Description & Applications: The CBK-2 is a circuit board, in kit form, designed to be installed in consumer-type equipment or its own enclosure. It provides two channels of conversion from unbalanced to balanced inputs and outputs with plus 20 dB to minus 20 dB of continuous gain adjustment in each direction. Outputs will drive 600 ohm loads and are short-circuit protected. User must provide power supply, connectors and enclosure

Basic Specifications & Suggested List Price: Frequency response: 20Hz-100kHz, +/-3 dB; S/N ratio: better than 70 dB, power requirements: regulated 6 to 36 volts or +/-3 to 18 volts at 70 ma. Suggested list price: \$39.95



ORBAN ASSOCIATES INC.
Programmable Mic Processor

ORBAN ASSOCIATES INC.

645 Bryant St.
San Francisco, CA 94107
(415) 957-1067

Product Name: Programmable Mic Processor

Contact: Sid Goldstein, marketing & sales mgr

Date Product Introduced: October, 1987

Product Description & Applications: The Programmable Mic Processor is a multi-function signal processor that includes compressor, 3-band parametric equalizer, noise gate/compressor gate, de-esser and effects return level. All of these functions can be fully modified and then programmed into one of 32 different memory registers for instantaneous recall

—CONTINUED ON NEXT PAGE

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Formerly with PTL Audio Department and DK Acoustic Consultants. Specializing in church and broadcast systems.



TOM FONNER

Formerly with Valley Audio. Experienced in recording and broadcast systems.



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(818) 792-6400 or (Toll Free) 1-800-848-TAPE

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NEW PRODUCTS

SIGNAL PROCESSING DEVICES

1988

—CONTINUED FROM PAGE 275

Optional mic preamp with 48-volt phantom power makes interface easy. Line level access is standard. MIDI-controllable. Unit is ideal for DJ mic processing or for multiple processing functions in the recording and video post-production facility.

Basic Specifications & Suggested List Price: Projected price, \$1,895. Availability: late 1987

ORBAN ASSOCIATES INC.
645 Bryant St.

San Francisco, CA 94107

(415) 957-1067

Product Name: Programmable Parametric Equalizer

Contact: Sid Goldstein, marketing & sales mgr.

Date Product Introduced: October, 1987

Product Description & Applications: The Programmable Parametric Equalizer is a 2-channel, 4-band/channel unit with tunable HP and LP filters. All EQ parameters are completely accessible and are fully programmable in any of 32 different memory registers for instantaneous set up and recall. The unit fulfills a wide variety of requirements in automated recording and mixdown, video post-production, film sound mixing and broadcast processing where immediate access to different parametric programs is required. The unit is MIDI-controllable with other interface options available soon.

ORBAN ASSOCIATES INC.
645 Bryant St.

San Francisco, CA 94107

(415) 957-1067

Product Name: Parametric Equalizer

Contact: Sid Goldstein, marketing & sales mgr.

Date Product Introduced: October, 1987

Product Description & Applications: The new 642B Parametric Equalizer is a third-generation analog equalizer designed for the digital era. It is a dual-channel, 4-band/channel (or cascaded for 8-band mono) with extremely low noise and distortion; it utilizes the basic design concepts popularized in the 622 series. The 642B offers a tunable 12 dB/octave sliding "Besselworth" LP filter along with an 18 dB/octave HP filter. It also contains a useful vernier control to make high-Q notching simpler and more accurate. The 642B will be useful in all recording, post-production and sound reinforcement situations.

ORBAN ASSOCIATES INC.
645 Bryant St.

San Francisco, CA 94107

(415) 957-1067

Product Name: Stereo Image Enhancer

Contact: Sid Goldstein, marketing & sales mgr.

Date Product Introduced: October, 1987

Product Description & Applications: The Stereo Image Enhancer is an in-line broadcast processor that magnifies and deepens the stereo image of the station on-the-air without increasing multi-path distortion. It detects and enhances the psychoacoustic directional cues present in all stereo program material and broadens the stereo image for greater impact on the dial while retaining full mono compatibility.

Basic Specifications & Suggested List Price: Estimated price \$895.

PACKBURN ELECTRONICS, INC.

216 Stratford St.

Syracuse, NY 13210

(315) 472-5644

Product Name: Audio Noise Suppressor, Model 323A

Contact: Richard C. Burns, president

Date Product Introduced: January, 1987

Product Description & Applications: Contains three processors designed to suppress transient noises (licks, pops, clicks, crackle, scratch) encountered on some 100 years of phonograph recordings, wherever and however made, as well as the audible hiss familiar in all audio media prior to the development of successful encode/decode noise suppression systems. Incorporates necessities and conveniences for the optimum playback of disc and cylinder recordings.

Basic Specifications & Suggested List Price: Price \$2,650

PEAVEY ELECTRONICS CORPORATION

PO Box 2898

Meridian, MS 39301

(601) 483-5365

Product Name: AddVerb (MIDI-capable Stereo Reverb Processor)

Contact: Ken Valentine, product manager

Date Product Introduced: June, 1987

Product Description & Applications: An all new MIDI-capable digital multi-effects processor with 100 preset effects including 50 stereo reverb sounds and a full array of delay effects such as chorus, flange, echo and special combination effects. Any of the 100 effects may be mapped to any of the 128 MIDI presets. 16-bit processing and proprietary VLSI circuitry allow superior effects and wide bandwidth performance.

Basic Specifications & Suggested List Price: Suggested U.S. list price: \$389.50.

PEAVEY ELECTRONICS CORPORATION

PO Box 2898

Meridian, MS 39301

(601) 483-5365

Product Name: UniVerb (Stereo Digital Reverb Processor)

Contact: Ken Valentine, product manager

Date Product Introduced: June, 1987

Product Description & Applications: The Peavey UniVerb offers quality 16-bit processing for 30 independent stereo reverb effects with wide-ranging room simulations. The available reverb sounds are easily accessed via a 16-position rotary switch and a push button bank selection switch. One of the positions for each bank provides a bypass for that bank. Remote bypass capability is included. The standard 19" rack chassis occupies one rack space.

Basic Specifications & Suggested List Price: Suggested U.S. list price: \$299.50.

QUANTEC/MARSHALL ELECTRONIC

PO Box 438

Brooklandville, MD 21022

(301) 484-2220

Product Name: QRS/XL

Contact: Pirkko Polso, secretary

Date Product Introduced: Spring 1987

Product Description & Applications: The XL is the fastest, most powerful audio computer ever developed. The pipelined internal structure and special hardware allow accurate complex audio processing that exceeds anything before possible and runs in real time applications that take a VAX 20 minutes per minute to run! A control program is delivered with each XL, allowing your personal computer to interface for real time control of parameters and for compiling new special effects designed by the owner.

Basic Specifications & Suggested List Price: Two independent channels of processing; oversampled I/O: 2X input, 4X output; total phase linear I/O filters, 32-bit processing, RS-232, MIDI, 80-character display; runs anything you can build and download; nonvolatile memories for user designed effects. Reverb, filters (to 3,600 dB/oct!), delays, flanges, gates, etc.

RANE CORPORATION

6510 216th SW

Mountlake Terrace, WA 98043

(206) 774-7309

Product Name: DC24 Dynamic Controller

Contact: Terry Pennington

Date Product Introduced: June, 1987

Product Description & Applications: Completely independent compressor, limiter and expander/noise gate with separate threshold and ratio controls for each function. Includes new "Servo-Lock" limiter design and built-in 24 dB/octave Linkwitz-Riley crossover for band-split, dynamic control or separate compression/limiting of high and low drivers in sound reinforcement.

Basic Specifications & Suggested List Price: THD + noise: < 0.05%; signal-to-noise: 92 dB below +4 dBm; maximum input: +22 dBu; max output: +28 dBu, balanced; size: 1.75"H x 19"W x 5.25"rack depth. List price for stereo DC24: \$499.

SCHOLZ RESEARCH & DEVELOPMENT, INC.

1560 Trapelo Rd.

Waltham, MA 02154

(617) 890-5211

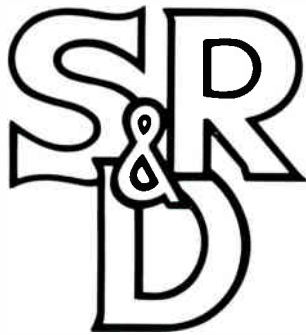
Product Name: Rockman Stereo Echo

Contact: Jane F. Braun, advertising manager

Date Product Introduced: June 27, 1987

Product Description & Applications: For the versatility you want and quality you need in sound processing equipment, look to the newly expanded Rockmodule Series. The Rockmodules were specifically designed to suit a wide range of studio and live performance applications. The Rockman Stereo Echo offers a huge sound with separate echoes (up to 500 milliseconds) bouncing between two channels. Choose from three different preset stereo mixes, compatible with stereo or mono systems. Your input signal can be mono or stereo. The stereo echo heard on Boston's *Third Stage*.

Basic Specifications & Suggested List Price: List price \$249.95 Input: maximum level 4.5Vrms (+13 dBv), impedance over 2M ohms; stereo inputs: impedance 100 ohms max. level 4.5Vrms (+13 dBv); delay: left echo 100 to 500 msec, right echo 50 to 250 msec, feedback variable, 0 to infinity, frequency response variable, 16kHz to 3.2kHz.



SCHOLZ RESEARCH & DEVELOPMENT, INC.
Waltham, MA

SCHOLZ RESEARCH & DEVELOPMENT, INC.
1560 Trapelo Rd.
Waltham, MA 02154
(617) 890-5211

Product Name: Rockman Stereo Chorus
Contact: Jane F. Braun, advertising manager
Date Product Introduced: June 27, 1987
Product Description & Applications: Scholz technology combines stereo imaging and chorus modulation to give you the unique Rockman Stereo Chorus Rockmodule. Featured is the unique Long Chorus for solos. The new Sweep Stop provides two different fixed delays. Both Long Chorus and Sweep Stop are now footswitchable. The Stereo Mixer section offers four choices: Wide Stereo, Normal Stereo, (the patented Rockman sound), mono and subtle mono. Preset any two mixes and footswitch between them. Only the Rockman Stereo Chorus lets you access eight different stereo effects, plus bypass, solely with footswitches.

Basic Specifications & Suggested List Price: \$169.95 list price. Input: impedance over 2M ohms, maximum level 4.5 Vrms (+13dBv); stereo outputs: four preset mixes, impedance 100 ohms, max. level 4.5 Vrms (+13 dBv); chorus: frequency response +1, -3 dB to 8kHz, sweep speed normal. 25 to 8kHz, sweep speed long chorus. 12 to 5Hz, pitch detuning: normal setting at 1/4-semitone, signal-to-noise ratio over 90 dB.

SCHOLZ RESEARCH & DEVELOPMENT, INC.
1560 Trapelo Rd.
Waltham, MA 02154
(617) 890-5211

Product Name: Rockman Graphic Equalizer
Contact: Jane F. Braun, advertising manager
Date Product Introduced: June 27, 1987
Product Description & Applications: The Rockman Graphic Equalizer is the first product of its kind specifically designed for musical instruments. This EQ is packed with signal processing power. Eight bands of EQ are concentrated in the mid-range frequency spectrum crucial for guitar players. No other EQ offers 1/2-octave resolution like this or in this price range. This Rockmodule also has passive noise reduction circuitry for the best signal-to-noise ratio with no altering of signal dynamics, making it versatile enough to be used as a pre-amplification device before a high gain amplifier. Designed for both guitar level and line level operation, this EQ includes separate input and output level adjustment plus bypass foot-switching.

Basic Specifications & Suggested List Price: List price \$149.95. Frequency response (sliders at "0"): 20Hz-20kHz +/-3 dB; filtering: ±12 dB bands at 62, 125, 250, 500, 700Hz, 1k, 1.4k, 2k, 3k, 4k, 16kHz, ±12 dB shelf at 62Hz.

SCHOLZ RESEARCH & DEVELOPMENT, INC.
1560 Trapelo Rd.
Waltham, MA 02154
(617) 890-5211

Product Name: Rockman Distortion Generator
Contact: Jane F. Braun, advertising manager
Date Product Introduced: June 27, 1987
Product Description & Applications: The Rockman Distortion Generator gives you the patented Rockman Distortion sound and the overall tone control you need to tailor the Rockman sound to your playing style. The Rockman approach to Distortion features a 3-position Distortion Harmonics switch and 3 bands of pre-distortion EQ including: bass, mid and upper mid. Also included is post-distortion treble for complete tone control. The available footswitch functions include lead boost for increased volume and upper mid-range gain, plus bypass. Additional features include an output volume control and LED indicators for distortion threshold, bypass and lead boost.

Basic Specifications & Suggested List Price: List price:

\$139.95; input: impedance over 2M ohms, max. level 4.0V (+12 dBv); compressor: adjustment range: 30 dB (30, 40, 50, 60); output: impedance 470 ohms, max. level 4.5V (+13 dBv); vol. adj. range 15 dB continuous, treble boost range 12 dB continuous; pre-distortion EQ: bass -5 dB to +5 dB, mid boost 0 dB to +10 dB, 2kHz notch -10 dB to 0 dB.

S.E.M. CO.
3782 Westridge Ave.
West Vancouver, BC, V7V 3H5 Canada
(604) 922-0526

Product Name: 400 Series
Contact: E. Ebert, manager
Date Product Introduced: April, 1987
Product Description & Applications: The 400 Series Digital Delay is a dual-channel 16-bit modular system with A/D, delay and D/A on separate PCBs. Delay is adjustable in 24.4 micro-second steps (12.2 micro sec. if operated in mono mode). Delay length is virtually limitless due to the modular approach. Each delay module has a max. delay capability of 0.8 sec.
Basic Specifications & Suggested List Price: 16-bit A/D - D/A, 64k delay memory, over 90 dB dynamic range, 44.1kHz sampling frequency, response to 20kHz module size 100 x 160mm. List price is \$190 to \$320 Canadian per module.

S.E.M. CO.
3782 Westridge Ave.
West Vancouver, BC, V7V 3H5 Canada
(604) 922-0526

Product Name: 900 Series
Contact: E. Ebert, manager
Date Product Introduced: April, 1987
Product Description & Applications: The 900 Series Modular Signal Processing Units were designed to fit in a 5.25" DIN standard cardframe which can house up to 15 modules. Processors available are: octave equalizers, notch filters, routing switchers, VCAs, DAs and digital controllers, etc. Removable front covers allow access to each module's operating controls.
Basic Specifications & Suggested List Price: Specifications, features and price varies with each module.

SONIC RESEARCH ASSOCIATES
PO Box 13744
Arlington, TX 76094
(817) 834-4711

Product Name: Tri-Ambient Synthesis Stereo Soundfield Processor™
Contact: Kyle Holbrook, pres. & marketing
Product Description & Applications: The Tri-Ambient Synthesis Stereo Soundfield Processor™ is a patented device which reproduces dramatic stereo sound from any stereo audio format. The device preserves stereo imaging integrity throughout large areas of rooms. The operating principle of the product is to combine a specific T-pattern loudspeaker geometry with electronic circuitry to present the brain with information necessary to perceive the finer detail in stereo recordings. For use in nightclubs, theaters and audio/video monitoring situations.

Basic Specifications & Suggested List Price: The Model SRA-573 is a stereo input, multi-channel output signal processor. A full range monophonic output is provided for subwoofers or distribution amplifiers. Output stages are electronically balanced, XLR-type connectors with push-pull operation capable of driving +24 dBv into a 10k ohm load. The device is 1.75"H x 19"W x 12"D and is rack mountable with a detachable 3-conductor power cord.

STATE OF THE ART ELECTRONIK, INC.
43-1010 Polytek St.
Ottawa, Ontario, K1J 8Z2 Canada
(613) 744-1003

Product Name: AAX-2 Acoustic Align Crossover System
Contact: Dr. Claude Fortier
Date Product Introduced: October, 1987
Product Description & Applications: An electronic crossover system featuring proprietary patented filters which provide equal phase and time outputs for all bands. Some of the features are: flat summed magnitude response; dual channel 2-way, 3-way or 4-way operation; 24 dB/octave slope filters (6 dB down at crossover); built-in equalization, switchable in or out for driver compensation; fully balanced inputs and outputs; can be optimized for any speaker system.
Basic Specifications & Suggested List Price: Filter type: 24 dB/octave phase corrected all pass (patented); frequency response: 20Hz to 20kHz to +/-0.1 dB of calculated filter response; THD (+18 dB out), 0.002% typical at 1kHz; signal-to-noise ratio: greater than 100 dB, 22Hz to 22.5kHz (RMS); dimensions: 1.75 x 19 x 9.5".

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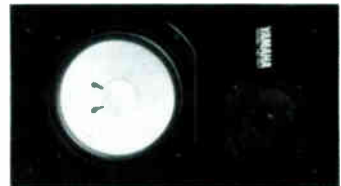
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Speaker Components

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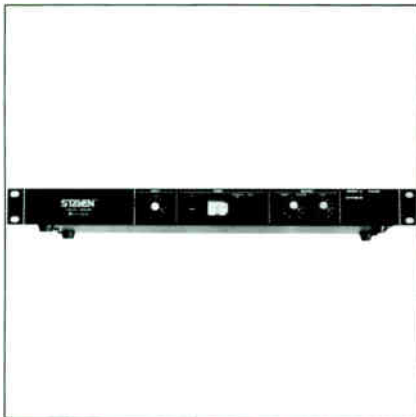


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STEVEN ELECTRONICS
Steven PDR-3500 Digital Reverb

STEVEN ELECTRONICS/DIV. OF LP MUSIC GROUP
160 Belmont Ave.
Garfield, NJ 07026
(201) 478-6903

Product Name: Steven PDR-3500 Digital Reverb
Contact: George Rose, sales manager
Date Product Introduced: June 27, 1987
Product Description & Applications: The Steven Digital Reverb is a MIDI compatible reverb processor with 63 preset reverb sounds, including 50 natural reverbs, 9 gated effects and 4 reverse effects. The unit is rack mountable in a 19" single space frame and incorporates input, output, mix and level controls. It has a wide range of algorithms, a bypass switch and stereo and mono 1/4" jacks.
Basic Specifications & Suggested List Price: Input level: -10 dBV; input impedance: 10k ohms; output level: 0 dBV; output impedance 600 ohms; frequency response: direct 10Hz to 20kHz +/-1 dB, reverb: 30Hz to 10kHz +/-2 dB; S/N ratio: more than 60 dB (input shorting); dynamic range: 75 dB (typical reverb programs) Retail price \$379.

STEVEN ELECTRONICS/DIV. OF LP MUSIC GROUP
160 Belmont Ave.
Garfield, NJ 07026
(201) 478-6903

Product Name: Steven Graphic Equalizers PEQ-3300M and PEQ-3400S
Contact: George Rose, sales manager
Date Product Introduced: September, 1987
Product Description & Applications: The Steven PEQ 3300M 31-band single channel EQ and PEQ-3400S 15-band dual channel EQ are cost-effective graphic equalizers which feature low-noise circuitry in a 19" rack mount format. Both units include balanced and unbalanced inputs and outputs, switchable hi-pass filters and choice of boost/cut ranges (+/- 6 dB or +/-12 dB)
Basic Specifications & Suggested List Price: PEQ-3300M suggested retail \$299.95 PEQ-3400S suggested retail \$309.95

STUDIO TECHNOLOGIES, INC.
5520 W. Touhy Ave.
Skokie, IL 60077
(312) 676-9177

Product Name: ISS Integrated Simulator System
Contact: Carolyn Cashel, dir. of mktg.
Date Product Introduced: March, 1987
Product Description & Applications: The ISS is a simulator system of top sonic quality and technical performance designed in a modular card-based format that lets you configure a system to best fit your specific needs. Mono program material is converted into excellent simulated stereo for MTS broadcasting. Sophisticated circuitry allows you to control the conversion manually or automatically, placing the simulated stereo on-air as required. Plus, the ISS is easy to install, operate and service.
Basic Specifications & Suggested List Price: The basic system is priced at \$3,995. Optional cards include: Simulator Type II, extends low and high frequency simulation for enhanced stereo sound; Recognition Function, which can detect mono in any one of a number of combinations; and Polarity Correction, which contains circuitry to detect and correct 180-degree phase reversal on input signals.

SYMETRIX, INC.
4211 24th Ave. W.
Seattle, WA 98199
(206) 282-2555

NEW PRODUCTS

SIGNAL PROCESSING DEVICES

1988

Product Name: 511A Noise Reduction
Contact: Doug Schauer, marketing director
Date Product Introduced: September 1, 1987
Product Description & Applications: A 2-channel, single-ended noise reduction unit configured for professional and commercial audio systems. Provides up to 30 dB noise reduction from any source, no encoding required. Combines a dynamic high frequency filter with a downward expander. Complete control complement. 18 dB/octave rumble filter included. Stereo interconnect provided. Balanced or unbalanced, +4 or -10 operation.

Basic Specifications & Suggested List Price: Program controlled high frequency filter (1kHz to 35kHz), threshold -50 dBm to +10 dBm. Downward expander ratio 1:1 to 1:6; threshold -40 dBm to +10 dBm. Max. output +24 dBm bal. frequency and expander meters. 20Hz to 20kHz, +0, -1 dB. THD 0.25% (20Hz to 20kHz), noise >-90 dBm

TANTEK C/O THE RUSS JONES MARKETING GROUP
17700 Raymer St., Ste. 1001
Northridge, CA 91325
(818) 993-4091

Product Name: Master Matrix (M4100)
Contact: Geoff Ryle, products specialist
Date Product Introduced: June, 1987
Product Description & Applications: The Master Matrix is a unique device for interconnecting audio equipment in the studio or on stage, bringing analog routing under real control. The unit will interconnect 12 sources of audio signal with 16 destinations in any combination and since every input and output is buffered, multiple splits can be implemented without imposing any additional load on the source. The unit stores up to 99 patches which may be recalled via MIDI "program change".

Basic Specifications & Suggested List Price: Retail: \$2,495, frequency response: +/-0.5 dB 20Hz to 20kHz, 7Hz to 80kHz (-3 dB); output noise: -96 dBm (A-weighted); THD: 0.007%; max. output level (into 6,000 ohms): +20 dBm; crosstalk: -95 dB; input impedance: 47k ohm; output impedance: < 1 ohm; patching time: 2ms max.; dimensions (WxHxD): 483 x 88 x 266mm.

TDM DESIGN
Rt. 1, Box 573
Hillsboro, OR 97124
(503) 647-5957

Product Name: 24CX-2 XLR, 24CX-4 XLR
Contact: Tim Miller, owner
Date Product Introduced: March, 1987
Product Description & Applications: 24 dB/octave electronic crossover. The 24CX-4 XLR can be used as quad 2-way, mono 5/4 way or a stereo 3-way. The 24CX-2 XLR can be used as stereo 2-way or mono 3-way. The XLR version is similar to the standard 24CX-2/4 crossovers, but now offers internal AC transformers. Optional adjustable limiters on all outputs, selectable low summing, an internal insertion connector on every output (for a special EQ circuit, time delay or filter), and of course XLR connectors.
Basic Specifications & Suggested List Price: Crossover frequency range: 80-9kHz; maximum output level: +21 dBu; signal-to-noise ratio: 108 dB at +21 dBu. 24CX-2 XLR retail \$379. 24CX-4 XLR retail \$479.

TROISI EDC
27 River St.
Westford, MA 01886
(617) 692-7768
Product Name: EQ 2518

Contact: Stewart Adam, VP marketing & sales
Date Product Introduced: November, 1986
Product Description & Applications: The 2518 is a 1 1/2" rack unit which contains 2 channels of 3-band parametric equalization, with an additional fourth band pass filter. Both channels can work separately or be merged together via front panel controls.
Basic Specifications & Suggested List Price: Each parametric band covers 7 octaves with an adjustable bandwidth (Q) of .08 to 3.3 octaves (peaking), 6 dB to 24 dB per octave (shelving). Typical distortion is .004%. The EQ 2518 comes with a 2-year parts and labor warranty. Suggested list price \$1,200

VALLEY INTERNATIONAL, INC.
PO Box 40306, 2817 Erica Pl.
Nashville, TN 37204
(615) 383-4737

Product Name: Autogate
Contact: Tom Irby, vice president sales and marketing
Date Product Introduced: March, 1987
Product Description & Applications: The Autogate is a 2-channel frequency selective noise gate/expander. Each of the unit's two channels consists of an automatic gate and expander featuring a continuously variable high pass and low pass filter set, a dynamic low pass filter and continuously variable threshold, range and release controls. A filter mode switch allows the normal filter set to be assigned either to the audio chain or to the external input. Additionally, the filter set offers a dynamic low pass filter which may be inserted in the audio chain for elimination of high frequency noise. Proprietary Auto Slope circuitry dynamically alters the slope of the Autogate in response to program content dependent upon the range control setting. Program variable release shape circuitry continually analyzes the input signal level and the settings of the threshold, range, and release controls, and dynamically varies the release time so that the gate exhibits the desirable characteristics offered by a "hold" circuit.

Basic Specifications & Suggested List Price: Signal input impedance 100k ohm balanced, 50k ohm unbalanced, max. input level at 1kHz +24 dB; nominal input level at 1kHz -10 dB to +4 dB; signal input common mode rejection: greater than or equal to 40 dB, 50Hz to 15kHz; output impedance: < 50 ohm balance, < 25 ohm unbalanced; max. output before clipping: +24 dBm (600 ohm balanced, +21 dBm (600 ohm) unbalanced, quiescent distortion at +10 dB input, unity gain into 600 ohm: less than or equal to .02 1kHz THD, less than or equal to .06% SMPTE IMD; output noise and hum at unity gain, source impedance approx. equal to 1,000 ohm: less than or equal to -83 dB. List price \$699

VALLEY INTERNATIONAL, INC.
PO Box 40306, 2817 Erica Pl.
Nashville, TN 37204
(615) 383-4737

Product Name: Model 817 Commander
Contact: Tom Irby, vice president sales and marketing
Date Product Introduced: April, 1987
Product Description & Applications: The 817 is a single-channel compressor/expander module designed to be housed in and powered by any of the Valley 800 Series powered rack enclosures. The Commander's compressor section features continuously variable threshold, attack time, ratio and release time controls. An interactive expander is integrated with the compressor control circuitry to reduce residual noise which would be "pumped up" or accentuated by the compression process. Symmetrical release coupling circuitry makes the transition from compression to expansion imperceptible, thus eliminating the audible "turn on" noise or noise floor recovery experienced through use of less sophisticated or dedicated-function units. Linear integration detection and peak reversion correction circuitry are employed on the Model 817 to maintain correct musical relationships and to ensure accurate processing of the entire audio spectrum.
Basic Specifications & Suggested List Price: Signal input impedance: 100k ohm balanced, 50k ohm unbalanced, maximum input level: +24 dB; output impedance: less than or equal to 50 ohm bal. or unbal.; max. output level: +24 dB (600 ohm or greater) balanced, +21 dB (600 ohm or greater) unbalanced; quiescent distortion at +10 dB input < .01% 1kHz THD at unity gain, less than or equal to 0.4% SMPTE IMD at unity gain, output noise and hum at unity gain, source impedance approx. equal to 1,000 ohm: less than or equal to 83 dB (20Hz to 20kHz). List price \$420

WALKER/DDS
6850 35th NE, Ste. 1
Seattle, WA 98115
(206) 527-4371

Product Name: AB-10
Contact: Bob Rice
Date Product Introduced: October, 1987
Product Description & Applications: Walker/DDS introduces the AB-10 Ambient Noise Controlled Gain Circuit. The VCA circuit is controlled so that the foreground music/paging volumes in a lounge/restaurant environment are delicately matched. This self-controlled unit can match the quietest of spaces, to the loudest lounge. The line inputs are balanced by LEDs, with a sampling microphone input control. This allows microphones from various manufacturers. The AB-10 occupies a single 19" rack space.
Basic Specifications & Suggested List Price: Input balance 20k, line level -20 dB to +15 dB, unbal. 100k line level -20 dB to +15 dB. Mic. input bal. 6.8k, unbal. 50k (+12 phantom); output bal. 24 dBm min. into 600 ohms, unbal. 18 dBm min. into 600 ohms S/N ratio > 70 dB at output. Power wall mount transformer < 100ma

SPEAKERS AND MONITORS

1988

AMR (AUDIO MEDIA RESEARCH)

PO Box 1230
Meridian, MS 39301
(601) 483-5372

Product Name: PRM Series Studio Monitors
Contact: Ken Valentine, product manager
Date Product Introduced: June, 1987
Product Description & Applications: In January of 1987, AMR introduced the concept of switch-selectable response modes for studio monitors with the introduction of the PRM 208s. This concept has now been carried over to two other models in the AMR line, the PRM 308s and PRM 310s. Two response modes effectively give the mix engineer the capabilities of two monitors in one unit. One of the response modes is typically a "voiced" response and the other flat.

Basic Specifications & Suggested List Price: The five quality studio monitors in the AMR line range in price from \$99.50 for the small two-way PRM 205A to \$439.50 for the PRM 312A three-way model

ANCHOR AUDIO, INC.

913 W. 223rd St.
Torrance, CA 90502
(213) 533-5984

Product Name: AN-256W
Contact: Jon Pearson, sales manager
Date Product Introduced: June 1, 1987
Product Description & Applications: The AN-256W is a high quality portable sound system that includes two balanced lo-Z mic inputs, a line level input and a high band Samson wireless microphone receiver installed. This gives the user four mixable inputs (3 mic and 1 line). Line level and external speaker outputs are standard. Both hand-held and lavalier transmitters are available. The system is enclosed in a protective "roadie" case.

Basic Specifications & Suggested List Price: Pro net \$699; rated power: 75 watts continuous; frequency response: 60Hz to 20kHz +/-4dB; maximum SPL at 1M: 109dB, dimensions (with covers): 8.5" x 12.8" x 11.5" (HWD), weight: 18 lbs.

APOGEE SOUND INC.

1150 Industrial Ave., Ste. C&D
Petaluma, CA 94952
(707) 778-8887

Product Name: 3X3
Contact: Brian Glenn, VP marketing
Date Product Introduced: March 2, 1987
Product Description & Applications: The Apogee 3X3 is an arrayable 15-degree trapezoidal enclosure comprised of two high power 15" drivers in a combination horn-loaded/bass-vented configuration, a 2" throat compression driver utilizing a fluid-cooled titanium diaphragm coupled to an advanced constant directivity mid-range horn and an array of four 1" throat tweeters.

Basic Specifications & Suggested List Price: Frequency response 65-19k Hz +/-4 dB, sound pressure level 130 dB continuous, 13 dB peaks, power handling 1,100 watts continuous, 3,300 watts peak; suggested list \$3,825, accompanying processor list \$2,150

BAG END, A MITEK GROUP CO.

One Mitek Plaza
Winslow, IL 61089
(815) 367-3000

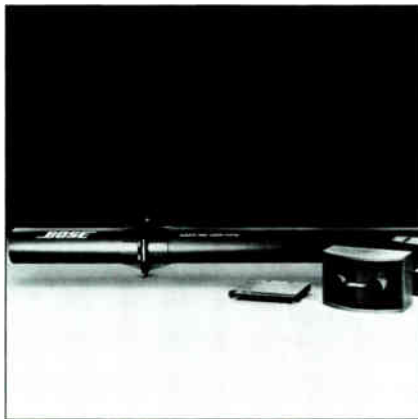
Product Name: AF1-M1
Contact: Willie Warnock, regional sales rep
Date Product Introduced: May, 1987
Product Description & Applications: The AF1-M1 is a time-aligned loudspeaker system unsurpassed in acoustical and structural integrity. The time-align requires that the fundamental and overtones of a complex, transient acoustical signal presented to the listener be in the same relationships as the natural sounds. This means that a rapid series of transients will be heard clearly. Cabinets are constructed with rabbit joints, high-grade 3/4", 13-ply birch plywood, steel pins, flush-mounted handles and inputs and interlocking corners

Basic Specifications & Suggested List Price: \$1,280. System type: time-aligned, 3-way, ported; freq. resp. 3 dB 40Hz to 19kHz; sensitivity 103 dB SPL/volt/meter; power handling: 300W contin. sine wave below 125Hz, 1,200W instantaneous peak below 125Hz, 200W cont. sine wave below 125Hz, 800W instantaneous peak below 125Hz; dimensions: 43" x 22" W x 18" D (including cover)

BLACK CAT SOUND SERVICE/CHRISTRONIX

10134 Ladybird
Grass Valley, CA 95949
(916) 266-1620

Product Name: Chrstronix Model 20
Contact: Chris Christensen, owner
Date Product Introduced: June, 1987
Product Description & Applications: The Chrstronix Model 20 system is a two-box three-way loudspeaker system. Each box is approx. 36"H x 21.5"W x 18"D. These compact high-quality systems can be configured as a single box full range system for side fill or drum monitor applications. These systems can be configured with drivers selected by the customer or with our standard drivers. These units are in limited production.
Basic Specifications & Suggested List Price: The Model 20 cabinets are built from 9 ply hardwood plywood. The basic 2-box configuration is an 18" driven in a bass reflex cabinet. The mids are handled by a 12" speaker in a short large throat horn, and the highs are handled by a 60-degree x 120-degree constant coverage horn. Prices start at \$325



BOSE CORPORATION
Acoustic Wave® Cannon™ System

BOSE CORPORATION

The Mountain
Framingham, MA 01701
(617) 879-7330

Product Name: Acoustic Wave® Cannon™ System
Contact: Mark Mayfield, marketing development specialist
Date Product Introduced: February 10, 1987
Product Description & Applications: The Acoustic Wave Cannon System is the bass reproduction component of two new systems from Bose—the Cinema Sound System (for movie theaters) and Wave™ Systems (for nightclubs, performing arts centers, etc.). It is a 12"-long tube which incorporates proprietary Bose Acoustic Wave technology and operates in the 25Hz to 125Hz frequency range, with extreme efficiency and sonic clarity.

Basic Specifications & Suggested List Price: Useable frequency range 25Hz to 125Hz, length: 12"; weight: 55 lbs (including driver)

CERWIN-VEGA

555 E. Easy St.
Simi Valley, CA 93065
Product Name: CM-12

Contact: Rich Mandella, professional division
Date Product Introduced: In production August 1, 1987
Product Description & Applications: Cerwin-Vega's series of control room monitors has been designed to meet the challenge of accurately reproducing the most demanding recorded source material. With performance capabilities far beyond their relatively compact size, these advanced monitor designs can complement virtually any home or commercial recording installation. Although occupying a minimum amount of space, the CM-12 can generate 112 dB in a medium size control room with only moderate input power.

Basic Specifications & Suggested List Price: Description 3-way 12" high-performance studio monitor, linear frequency response: 32Hz-20kHz; power handling capacity: 150W, SPL at 1W, 1m: 96 dB, SPL at rated input, 1m: 117 dB, nominal impedance: 8 ohms; L.F. component: 12" cone, M.F. component: 6" cone; H.F. component: 1" voice-coil horn, crossover frequencies: 700Hz and 3.5kHz; connections: push terminals, enclosure type: vented, direct-radiating; enclosure construction: 3/4" pressed wood, finish: professional black vinyl finish, protection: high-frequency circuit breaker, controls: high-frequency level, dimensions (H x W x D): 23 5/8" x 14 25/8" x 14", packed weight: 44 lbs., list price: \$350 each

COMMUNITY LIGHT & SOUND, INC.

333 E. Fifth St.
Chester, PA 19013
(215) 876-3400

Product Name: CS52 loudspeaker
Contact: Gregory A. DeTogne, publicist, (312) 367-8187
Date Product Introduced: May 1, 1987
Product Description & Applications: Representing an ideal choice for either live sound reinforcement or playback/monitoring situations, the new CS52 from Community combines high sensitivity and power handling capabilities with smooth response and low distortion to form the latest addition to the CS Series of loudspeaker systems. Acoustically, the 3-way CS52 is operable between 40Hz and 20kHz, and features wide bandwidth, uniform wide-angle dispersion, an extended frequency range, and a coherent wavefront design allowing for precise time performance.

Basic Specifications & Suggested List Price: At the low-end, a 15" bass transducer is outfitted with an overhung edge-wound voice coil in a symmetrical fringe-field magnet gap to insure long linear excursion. Midrange frequencies are handled by a 6 5/8" cone driver coupled to a short compound horn, and for high frequencies, a PZT driver is mounted on a Community wide-angle Pattern Control Horn to insure uniform coverage and accurate flat response up to 20kHz. Suggested retail price is \$549

C-T AUDIO MARKETING, INC.

3050 SW 14th Pl., #3
Boynton Beach, FL 33426
(800) CT-AUDIO
(800) 282-8346

Product Name: OHM Speakers
Contact: Andre Wallon
Date Product Introduced: June, 1987
Product Description & Applications: OHM is a range of sound reinforcement loudspeakers that are compact, powerful and designed with aesthetics in mind. The range consists of 100-watt and 300-watt speakers which can be wall-mounted or stand-mounted. There is also a 300-watt sub-woofer. The range also includes a 75-watt powered wedge monitor.
Basic Specifications & Suggested List Price: 100-watt \$349, 300-watt \$549, Sub-woofer \$720, 75-watt powered wedge monitor \$649

DAHLQUIST, INC.

601 Old Willets Path
Hauppauge, NY 11788
(516) 234-5757

Product Name: M-905
Contact: Paul Josefson, field support manager
Date Product Introduced: April, 1987
Product Description & Applications: Two-way, front-firing tuned-port speaker system. Combination of high-efficiency (91 dB), with attributes of an audiophile loudspeaker.
Basic Specifications & Suggested List Price: 20-watt min/125 max, 8 ohms nom/6 ohms min. Crossover freq: 2,500Hz, freq response 40-24kHz. Walnut finish, 24" x 13 5/8" x 12 25/8". PVA laminated woofer, cast frame, 1" dome tweeter. List price \$590/pr

DDS

6850 35th NE
Seattle, WA 98115
(206) 527-4371

Product Name: CFD 1-90
Contact: Bob Rice, pres

—CONTINUED ON NEXT PAGE

Date Product Introduced: June, 1987
Product Description & Applications: Design Direct Sound/DDS introduces the CFD1-90pro, a 1" entry throat, continuous frequency distribution horn with a functional frequency range of 800Hz to 16kHz. The CFD1-90pro has a standard 90- by 40-degree pattern. All DDS professional line horns are constructed using biaxial stitched cloth with end grain balsa core, eliminating problems associated with ring or hangover. The CFD series horns are designed to provide consistent decibel for the full frequency response over a designated area.

Basic Specifications & Suggested List Price: Sensitivity 105.2 dB, frequency range 800Hz-16kHz, frequency response 1kHz-14kHz, mean dispersion 91Hx42V, mean directivity 9.1 (+6.8 -2.2 dB), dimension 9"H x 15"W x 7"D, weight 1.5 lbs.

ELECTRO-VOICE, INC.

600 Cecil St.
 Buchanan, MI 49107
 (616) 695-6831

Product Name: HPT94 and HPT64 Constant-Directivity Super-Tweeter Horns

Contact: Alan Shirley, market development manager

Date Product Introduced: June, 1987

Product Description & Applications: Two new HPT super-tweeter horns provide matching coverage with conventional high-frequency horns. The HPT64 and HPT94 super-tweeters have a 5" square mouth area for use in very compact main systems. Both models provide horizontal control down to 3,500Hz and vertical control down to 4,500Hz. Driver loading is maintained down to 1,500Hz for use in ultra-compact monitor designs with an appropriate driver. The 1" throat insures uniform dispersion to 20,000Hz. Like all HP TransPlanar™ horns, these HPT models provide very smooth response and the ease of flat-front mounting.

Basic Specifications & Suggested List Price: The HPT94 is a 90-degree x 40-degree constant-directivity horn with an SPL/1W/1m of 106 dB. The HPT64 is a 60-degree x 40-degree CD horn with an SPL/1W/1m of 108 dB. Both models measure 5.3" x 5.3" x 4.1" hwd. The HPT94 and HPT64 are available at a pro user net price of \$80 each.

ELECTRO-VOICE, INC.

600 Cecil St.
 Buchanan, MI 49107
 (616) 695-6831

Product Name: HP94 TransPlanar™ Constant-Directivity Horns

Contact: Alan Shirley, market development manager

Date Product Introduced: June, 1987

Product Description & Applications: The HP94 is a 90-degree x 40-degree constant-directivity component intended for use as the primary high-frequency horn in a system. This compact design has been optimized to provide uniform beamwidth control at today's higher crossover frequencies for high-level music systems. Convenient flat-front design makes the HP94 suitable for all modern boxed and clustered systems. Dimensions were carefully chosen for proper driver loading down to 800Hz, and to allow two horns to exactly fit in the space of one small conventional horn, making the HP94 perfect for system upgrades.

Basic Specifications & Suggested List Price: The HP94 90-degree x 40-degree CD horn has an SPL/1W/1m of 110 dB; good driver loading is maintained to 800Hz. The HP94 measures 11 0" x 8.0" x 8.7" hwd and weighs 4.5 lbs. A 60-degree x 40-degree version, model HP64, is identical to the HP94 except for coverage pattern and a slightly higher SPL 1w/1m of 112 dB. Pro user net price for either model is \$140.



ELECTRO-VOICE, INC.
 EVX

NEW PRODUCTS

SPEAKERS AND MONITORS

1988

ELECTRO-VOICE, INC.

600 Cecil St.
 Buchanan, MI 49107
 (616) 695-6831

Product Name: EVX low- and very-low-frequency reproducers

Contact: Alan Shirley, market development manager

Date Product Introduced: June, 1987

Product Description & Applications: Designed for today's high-impact, bass-predominate music program, four new EVX-series sound reinforcement woofers offer the world's highest commercially available power rating, with no sacrifice in efficiency and no increase in distortion. Each uses HeatWick™ design, the most advanced thermal engineering available, to provide dramatically improved heat transfer, each also features an extended-length voice coil with nearly twice the surface area of conventional woofer coils to further dissipate heat, increasing power handling and long-term reliability.

Basic Specifications & Suggested List Price: EVX models include the EVX-150, pro user net \$215, and the EVX-180, pro user net \$305, both of which handle up to 1,000 watts. Two EVX "super woofer" models handle up to 1,500 watts: the 15" EVX-1500, pro user net \$348; and the EVX-1800, pro user net \$498.



ELECTRO-VOICE, INC.
 MS-802

ELECTRO-VOICE, INC.

600 Cecil St.
 Buchanan, MI 49107
 (616) 695-6831

Product Name: MS-802 2-Way Monitor Speaker System

Contact: Gary Parks, marketing specialist

Date Product Introduced: January, 1987

Product Description & Applications: The new MS-802 2-way monitor speaker system provides accurate sonic control in a variety of recording and monitoring applications. Used as a semi near-field monitor, the MS-802 gives the recordist honest sonic information, ensuring a finished tape or pressing of exceptional quality. The 802 combines high efficiency, wide bandwidth, wide dispersion and sonic precision in a space-efficient design that's sized right for multi-track "demo" studios, MIDI recording studios or today's sophisticated home studios.

Basic Specifications & Suggested List Price: An 8" woofer provides accurate bass response to 45Hz. A high-power Super-Dome™ tweeter provides transparent reproduction to 18,000Hz. The 802 also features a front-mounted high-frequency control and an 80-watt long-term average power handling capacity. The enclosure measures 17 1/4" x 12" x 11 1/4" hwd. Suggested consumer price: \$450 per pair.

ENVIRONMENTAL SOUND

31220 La Baya Dr., #110
 Westlake Village, CA 91362
 (818) 706-0228

Product Name: ES-1002

Contact: Ron Gialthoffer, marketing

Date Product Introduced: January, 1987

Product Description & Applications: The ES-1002 features a 10" low-frequency polypropylene woofer and a 1" horn-loaded liquid filled high frequency tweeter. The loudspeaker is a flush mount baffle and incorporates six inserts for mounting hardware. Also provided is a removable grille. Both the baffle

and the grille can be color matched for architectural and interior designers. Applications range from theater reinforcement, restaurants, nightclubs, churches and custom home installations.

Basic Specifications & Suggested List Price: Minimum power required: 10-15 watts; maximum power: 150 watts; impedance: 8 ohms; system sensitivity: 92 dB (1 meter/1 watt); frequency response: 30Hz-24kHz; number of drivers: two; crossover frequency: 2,500Hz; dimensions: 16" x 16"; net weight: 20 lbs.; dealer prices (each): 1-10: \$145, 11-50: \$125, 51-100: \$100.

ENVIRONMENTAL SOUND

31220 La Baya Dr., #110
 Westlake Village, CA 91362
 (818) 706-0228

Product Name: Pro Drop Ceiling Monitor I

Contact: Ron Gialthoffer, marketing

Date Product Introduced: Revised, 1987

Product Description & Applications: The Pro Drop Ceiling Monitor I features an 8" low-frequency polypropylene woofer and a 1" horn-loaded dome tweeter. The loudspeaker enclosure is an isosceles configuration and is provided with internal T-nuts incorporating eyebolt hardware, removable grilles and a removable plate for mounting 25- or 70-volt transformers. Applications range from theater reinforcement, restaurants, nightclubs, churches, conference rooms to custom home installations. Speakers can be color matched.

Basic Specifications & Suggested List Price: Minimum power required: 5-10 watts; maximum power: 125 watts; impedance: 8 ohms; system sensitivity: 90 dB (1 meter 1 watt); frequency response: 38Hz-20kHz; number of drivers: two; crossover frequency: 2,500Hz; dimensions: (isosceles) two sides 11", width 12", length 23 7/8"; net weight: 25 lbs.; dealer prices (each): 1-10: \$170, 11-50: \$150, 51-100: \$125.



FORMULA AUDIO, INC.
 4400 Series

FORMULA AUDIO, INC.

Rt. 5, Box 440-3, Hwy. 39
 Zebulon, NC 27597
 (919) 269-6441

Product Name: 4400 Series

Contact: Jeffrey Alan Forsburg, president

Date Product Introduced: June, 1987

Product Description & Applications: 4403 and 4418 make up a 4-way concert system. The 4403 houses two 15" speakers, two 2" throat drivers mounted on a dual 60 x 90 horn with four slot tweeters attached. The 4418 has one 18" speaker, with both enclosures a trapezoidal covered in gray ozite carpet and constructed of 13-ply sides and back, with baffle 26-ply 1.5" thick. Foam/metal grille and flying points optional.

Basic Specifications & Suggested List Price: Weight: 4403 = 176 lbs., 4418 = 136 lbs.; size: 36" x 36" x 22" trapezoid; connectors: Cannon EP-4-14; X-over: 80Hz, 1.5kHz, 10kHz; range: 26Hz to 20kHz, 131 dB SPL +/- 4dB; cost: 4403 = \$3,199, 4418 = \$1,499.

INTERSONICS, INC.

3453 Commercial Ave.
 Northbrook, IL 60062
 (312) 272-1772

Product Name: SDL 4-15 Extended Range Subwoofer

Contact: T. Melzer, sales mgr.

Date Product Introduced: May, 1987

Product Description & Applications: The 4-15 has flat response to 16Hz! It can be used from 125Hz and below, and offers accurate low frequency response with high acoustic output. Applications include studio sound reproduction, live theater and cinema sound, special effects, sound cancellation and live and recorded music (especially utilizing extended bass

TANNOY®



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(retrofit)**



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- The lowest stated phase shift of any large studio monitor
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It is the artful blending together of these obvious advantages that yield a more musical, accurate,

powerful, non-fatiguing presentation of sound. This allows the engineer and producer to mold the finer details of a mix in a more precise way than ever before.

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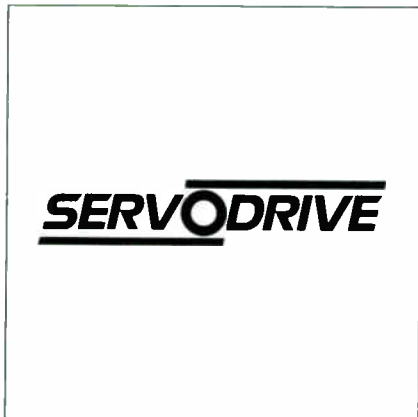
TANNOY
Professional Products

Tannoy North America, Inc.
300 Gage Ave., Unit 1
Kitchener, Ont.,
Canada, N2M 2C8
(519) 745-1158 Telex 069-55328

—CONTINUED FROM PAGE 280

and electronic organ). This is a closed-loop servo feedback system.

Basic Specifications & Suggested List Price: Useable frequency response: 14Hz to 125Hz; continuous power capacity: 300 watts, RMS; peak power capability: 800 watts, RMS; size: 18 x 23 x 36, weight: 75 lbs.; nominal impedance: 4 ohms.



INTERSONICS, INC.
SDL-5

INTERSONICS, INC.
3453 Commercial Ave.
Northbrook, IL 60062
(312) 272-1772

Product Name: SDL-5 Servodrive Subwoofer
Contact: T. Meizer, sales mgr.

Date Product Introduced: October, 1986

Product Description & Applications: Ideal for powerful, compact installation or sound reinforcement, the SDL-5 Servodrive is very rugged and capable of handling large low frequency peaks without sonic compromise. This subwoofer employs a high-tech, ultra-fast servo motor. The motor is extremely linear

NEW PRODUCTS

SPEAKERS AND MONITORS

1988

and efficient, and the shaft rotations are converted to linear motion through a piston assembly allowing 1/4" cone excursions.

Basic Specifications & Suggested List Price: Max. SPL - 140 dB. Size: 45 x 45 x 22.5; weight: 210 lbs.; enclosure: 14-ply birch shell and critical internal structures; continuous music power: 400 watts; musical input power: 1,000 watts; sensitivity: (one unit) 103 dB, 1W/1M; (four units) 107 dB, 1W/1M.

INTERSONICS, INC.
3453 Commercial Ave.
Northbrook, IL 60062
(312) 272-1772

Product Name: SDL-4 Servodrive Subwoofer

Contact: T. Meizer, sales mgr.

Date Product Introduced: April, 1987

Product Description & Applications: The SDL-4 is a smaller version of the SDL-5. Ideal for reduced installation space or studio sound reinforcement applications, the SDL-4 also employs an active cooling system that reduces output loss due to high-power heat to less than 1/2 dB at 450 watts for one minute! Like the SDL-5, the SDL-4 is quite efficient and offers clean, rich sound without compromise.

Basic Specifications & Suggested List Price: Size: 41 x 30 x 22.5; weight: 150 lbs.; enclosure: 14-ply birch shell and critical internal structures; continuous music power: 400 watts; musical input power: 1,000 watts; connectors (standard): dual banana, (or user's choice).

JAMO HIFI USA INC.
425 Huehl Rd., Bldg. 3A
Northbrook, IL 60062
(312) 498-4648

Product Name: Jamo Professional 300 and 400

Contact: Albert J. Copland (312) 475-5855

Product Description & Applications: The Professional Series

feature the superior efficiency of bass-reflex design for live performance as well as home installations. Unlike many monitors, the Professional Series doesn't sacrifice upper frequencies while achieving gut-wrenching bass. Jamo's proprietary Controlled Dispersion™ treble array of multiple horn-mounted tweeters enables amplification loads of as much as 400W continuous. Systems have standard XLR connection sockets and screwed terminals to accommodate cables as large as 6mm.

Basic Specifications & Suggested List Price: Professional Series 300 and 400 have peak power specs of 420W and 560W. Suggested retail prices: Professional 300 \$599.95, Professional 400 \$899.95.

JBL PROFESSIONAL
8500 Balboa Blvd.
Northridge, CA 91329
(818) 893-8411

Product Name: Performance Series Loudspeakers

Date Product Introduced: June, 1987

Product Description & Applications: The Performance Series offers musicians the performance and power handling they need from smaller setups. Each enclosure is made of plywood for strength and low-weight, with recessed handles for easy lifting. Each speaker is protected by a steel grille and rugged corner protectors.

Basic Specifications & Suggested List Price: The line consists of a full range of vocal, stage monitor and keyboard reinforcement systems: G-730 vocal reinforcement system (12", 2-way); G-731 stage monitor (12", 2-way); G-732 full-range horn-loaded system; G-733 3-way keyboard/reinforcement system; G-734 direct-radiator system (15", 2-way); and G-791 high frequency power pack, horn driver and crossover network add-on for existing equipment.

KLARK-TEKNIK ELECTRONICS, INC.
30 B Banfi Plaza N.
Farmingdale, NY 11735
(516) 249-3660

Product Name: Jade I MKII Reference Monitors
Contact: Harry Klane, sales

Date Product Introduced: July, 1987

Product Description & Applications: The Jade I MKII are designed as fully integrated and matched near field reference monitor systems for the accurate assessment of digital material. They present a solid image with minimum sonic coloration, and a punchy but tight bottom end. The support electronics, including the crossover and amplifiers, are located in acoustically isolated space within the cabinets. Transducer equalization and protection are incorporated into the active crossover design. A 100W MOSFET amplifier is provided for each driver.

Basic Specifications & Suggested List Price: 20k balanced/10k unbalanced input, 110/120/220/240, 50/60Hz selected mains, 55-17kHz +/-3dB; peak SPL at 1 meter: 113 dB; nominal input for max. output: +4 dBu; crossover frequency: 2.5kHz; crossover slope: 24 dB/octave, Butterworth, 8" Neoflex woofer, 1.25" dome tweeter; environmental compensation: +/-3 dB at 10kHz and 0 to -6 dB at 75Hz; level control: -infinity to +6 dB. Price TBA.

KLIPSCH & ASSOCIATES, INC.
Route 4, Oakhaven Rd.
Hope, AR 71801
(501) 777-6751

Product Name: KP-301A

Contact: Tracy Crawford, design engineer

Date Product Introduced: June 15, 1987

Product Description & Applications: The Klipsch KP-301A (shown) is a relatively compact, full range, portable system featuring textured black finish, interlocking corner protectors, edge trim, recessed handles, double fused input and 5-way binding posts and locking XLR input connectors. Additionally the KP-301B is a permanent installation version available without the trim, corner protectors or handles.

Basic Specifications & Suggested List Price: Drivers: 15" heavy-duty woofer, 1.5" horn midrange, 1" horn tweeter; frequency response: 45Hz-20kHz +/-4 dB, -10 dB at 36Hz; sensitivity: 101 dB at 2.83V, 1m.; power input: 200 W maximum continuous, configuration: 3-way, ported enclosure, dimensions: 32 3/4" H x 16 1/2" D x 20 3/4" W. Suggested list price \$759.

KLIPSCH & ASSOCIATES, INC.
Route 4, Oakhaven Rd.
Hope, AR 71801
(501) 777-6751

Product Name: KP-250A

Contact: Tracy Crawford, design engineer

Date Product Introduced: June 15, 1987

Product Description & Applications: The Klipsch KP-250A (shown) is a compact portable system featuring textured black finish, interlocking corner protectors, edge trim, recessed handle, recessed tripod socket (for use with KP-200TS tripod stand, shown), omnimount wall bracket mounting hardware, fused input and 5-way binding posts and locking XLR input connectors. Additionally the KP-250B is a permanent installation version available without the trim, corner protectors,

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The SDL subwoofers produce the most punch for their compact size. And, they deliver a solid, clean, effortless sound that is unachievable with voice coil speakers.

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SERVODRIVE

INTERSONICS, INC. 3453 Commercial Ave. Northbrook, IL 60062 312-272-1772

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handles and tripod socket.

Basic Specifications & Suggested List Price: Drivers: 12" heavy-duty woofer, 1.5" horn midrange, 1" horn tweeter, 1" horn tweeter; frequency response: 65Hz-20kHz +/-4 dB, -10 dB at 52Hz; sensitivity: 101 dB at 2.83V, 1m.; power input: 150 W maximum continuous; configuration: 3-way ported enclosure, dimensions: 22 3/4" H x 13 1/2" D x 16 3/4" W. Suggested list price \$592.

KLIPSCH & ASSOCIATES, INC.

Route 4, Oakhaven Rd.

Hope, AR 71801

(501) 777-6751

Product Name: KP-450A

Contact: Tracy Crawford, design engineer

Date Product Introduced: June 15, 1987

Product Description & Applications: The Klipsch KP-450A is a high output, high power, full range system. Features include textured black finish, interlocking corner protectors, edge trim, six recessed handles, split cabinet, split network, two concealed cabinet-locking ratchet mechanisms, concealed 4" heavy-duty casters, double fused input, 5-way binding post and locking XLR input connectors, and XLR to XLR parallel jumper (for HF unit). Additionally the KP-450B is a permanent installation version available without handles, corner protectors, edge trim, casters and locking mechanisms.

Basic Specifications & Suggested List Price: Drivers: two 15" heavy-duty woofers, 2" horn midrange; horn: 500Hz, shallow depth, wide angle (100 degrees); frequency response: 45Hz-20kHz +/-4 dB, -10 dB at 34Hz; sensitivity: 104 dB at 2.83V, 1m.; configuration: 2-way, ported enclosure; dimensions: 55-3/4" H x 18" D x 27 3/4" W. Suggested list price \$1,995.



KLIPSCH & ASSOCIATES, INC.
KP-201 A

KLIPSCH & ASSOCIATES, INC.

Route 4, Oakhaven Rd.

Hope, AR 71801

(501) 777-6751

Product Name: KP-201 A

Contact: Tracy Crawford, design engineer

Date Product Introduced: June 15, 1987

Product Description & Applications: The Klipsch KP-201 A (shown) is a compact portable system featuring textured black finish, interlocking corner protectors, edge trim, recessed handle, recessed tripod socket (for use with KP-200TS tripod stand), Omnimount wall bracket mounting hardware, fused input and 5-way binding posts and locking XLR input connectors. Additionally the KP-201B is a permanent installation version available without the trim, corner protectors, handles and tripod socket.

Basic Specifications & Suggested List Price: Drivers: 12" woofer, 1.5" horn midrange, 1" horn tweeter; frequency response: 50Hz-20kHz +/-4 dB, -10 dB at 38Hz; sensitivity: 96 dB at 2.83V, 1m; power input: 100 W maximum continuous; configuration: 3-way, sealed enclosure; dimensions: 22 3/4" H x 13 1/2" D x 16 3/4" W. Suggested list price: \$425.

MEYER SOUND LABS, INC.

2832 San Pablo Ave.

Berkeley, CA 94702

(415) 486-1166

Product Name: 500R Loudspeaker System

Contact: Gary Hudson, marketing/sales manager

Date Product Introduced: January, 1987

Product Description & Applications: The Model 500R is a compact, full-range loudspeaker system optimized for portable sound reinforcement applications. It is a 2-way system, comprising a 15" low frequency cone driver and a 2.8" hard dome high frequency driver with 40-degree x 90-degree horn and passive crossover. Together the 500R and 500 amplifier form a cost-effective, fully engineered system which is application-ready, requiring a minimum of time and effort to

achieve absolutely professional performance.

Basic Specifications & Suggested List Price: Acoustical frequency: 1,000Hz. Enclosure is 3.75 cu.ft. vented. Multi-laminate hardwood with perforated steel grille; finish: black textured; connector: male 3-pin, AXR type; cable is 10-meter, 14-gauge 2-conductor; dimensions: 20"W x 32"H x 14"D; shipping weight: 100 lbs.; list price: \$5,390 per system.

MEYER SOUND LABS, INC.

2832 San Pablo Ave.

Berkeley, CA 94702

(415) 486-1166

Product Name: 500RW Stage Monitor System

Contact: Gary Hudson, marketing/sales manager

Date Product Introduced: March, 1987

Product Description & Applications: The Meyer Sound 500RW is a full-range stage monitor designed for portable sound reinforcement for a variety of monitor applications. The road-worthy slant enclosure, fitted with recessed carrying handles, features a unique design that affords a choice of three different degrees of tilt when placed on the floor. Together, the 500RW and 500 amplifier form a fully engineered 2-channel stage monitor system which is application-ready, requiring a minimum of time and effort to achieve absolutely professional performance.

Basic Specifications & Suggested List Price:

Acoustical frequency: 1,000Hz. Enclosure is 2.6 cu.ft. vented, multi-laminate hardwood with perforated steel grille. Finish is black textured. Connector: male 3-pin AXR type. Cable is 10-meter, 14-gauge 2-conductor. Dimensions: 20"W x 26.75"H x 17.5"D; shipping weight: 90 lbs.; list price: \$5,590 per system.

MTX, A MITEK GROUP CO.

One Mitek Plaza

Winslow, IL 61089

(815) 367-3000

Product Name: CD60W8 Compression Driver

Contact: Thom Fehrman, regional sales mgr.

Date Product Introduced: April, 1987

Product Description & Applications: The CD60W8 is a high performance, wide-range compression driver designed for high-level, high-efficiency systems. High sensitivity along with great power handling capacity makes the CD60W8 ideal for applications ranging from voice and sound reinforcement to keyboard and instrument systems. Standard 1" screw-on compatible makes this unit's price/performance ratio one of the highest found today.

Basic Specifications & Suggested List Price: \$129.95. Size:

—CONTINUED ON NEXT PAGE

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The quality of McCauley loudspeaker systems goes far beyond cabinetry and exterior decor. Inside every McCauley system is what our company is all about, the driving force behind every system—its components. Not just a collection of pieces and parts that you find in so many other companies' boxes, but a precisely matched set of transducers that have been designed, engineered, and manufactured at McCauley and by



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system is reward
but to lay your
world of "Pure Per-
formance." Tame the Series 800 system at an authorized McCauley dealer. Call or write the factory for detailed product specifications.

McCauley Sound, Inc.

13608 94th Ave. E., Puyallup, Washington, USA 98373 (206) 848-0363

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1" throat inner diameter, 1 1/4" x 18 threads on throat exterior, magnet: 20 oz. barium ferrite; voice coil: 1/4" diam., Kapton bobbin, ferrofluid cooled; 8 ohm; phenolic impregnated cloth; -3 dB (103 dB, 1W/1M) w/recommended crossover 2,500Hz to 7,500Hz bandwidth, power handling w/recommended crossover 100W RMS, 200 W continuous program.

PASO SOUND PRODUCTS

14 First St.
Pelham, NY 10803
(914) 738-4800
Product Name: C1000 High Performance Utility Speaker System
Contact: David Moore, sales manager
Date Product Introduced: April, 1987
Product Description & Applications: The C-1000 is a versatile 50-watt 16-ohm high performance speaker system designed for mobile sound reinforcement, staging, spot monitoring, studio monitoring or fixed music reproduction applications such as foreground music systems. The C-1000 system provides 1/4" jacks at each end cap for "cascading" several speaker systems. The computer-designed steel hexagon enclosure is rugged enough for constant road use.
Basic Specifications & Suggested List Price: Power rating: 50-watt RMS; frequency response: 120 to 20,000Hz; nominal impedance: 16 ohms; sound pressure level: 107 dB, drivers used: two 5" + tweeter; input/output jack: 1/4" standard; cable supplied: 32' with 1/4" metal plug on each end; dimensions: 17" H x 6.25" W x 4.25" D; housing finish: black steel; net weight: 9 lbs. Price \$321.40.

PEAVEY ELECTRONICS

PO Box 2898
Meridian, MS 39301
(601) 483-5365
Product Name: HDH Series Loudspeaker Systems
Contact: Hollis Calvert, product manager
Date Product Introduced: June, 1987
Product Description & Applications: The HDH Series includes the HDH-1, HDH-2, HDH-3, HDH-4 and the HDH-M. Each is designed to be used with the HDH processor/controller for high-level, high-performance sound reinforcement or stage monitoring applications. The HDH-1 is a 3-way system with a trapezoidal enclosure and built-in flying hardware. The split version of the HDH-1 consists of the HDH-3 and HDH-4. The HDH-2 is a small, highly portable 2-way system and the HDH-M is a high-performance 2-way stage monitor.
Basic Specifications & Suggested List Price: Suggested U.S. list prices: HDH-1 is \$1,599.50, HDH-2 is \$649.50, HDH-3 is \$649.50, HDH-4 is \$1,099.50, HDH-M is \$599.50, HDH Processor is \$299.50

PROFESSIONAL AUDIO SYSTEMS

1224 W. 252nd St.
Harbor City, CA 90710
(213) 534-3570
Product Name: Coaxial Studio Monitor
Date Product Introduced: July, 1987
Product Description & Applications: Coaxial Studio Monitor with TOC™ (time offset correction). Compact black oak enclosure with high-power handling, excellent intelligibility, and low distortion. Monitor's System Processor has turn-on/turn-off relay protection, subsonic and supersonic filters, input limiting, the delay for acoustic alignment and the crossover filters.
Basic Specifications & Suggested List Price: Suggested retail \$4,200 U.S. System configuration: 2-way, bi-amplified; frequency response: 37Hz to 20 kHz +/-3 dB; phase response: 100 Hz to 10kHz +/-10; sensitivity 102 dB (1 watt, 1 meter); power handling: 250 watts RMS (into 8 ohms) low section, 100 watts RMS (into 8 ohms) high section.

**RAMSDELL AUDIO
DIVISION OF RAMSDELL ENTERPRISES**

PO Box 76186
St. Petersburg, FL 33734
Product Name: Ramsdell Audio SW-2710
Contact: Pamela Ramsdell, co-owner
Date Product Introduced: June 27, 1987 NAMM
Product Description & Applications: This is a 27" sub-woofer which we call the Ramsdell Audio SW-2710 with a 6.3" edge wound voice coil capable of reproducing the lowest octaves, cleaner and with greater transient response than any other driver of its class. It is suitable for any high-power, low-frequency application. This is not just another large speaker. A computer-aided design parameters for cabinet construction is provided with each order.
Basic Specifications & Suggested List Price: Frequency response: 15-300Hz which depends on enclosure volume; sensitivity: 1 watt at 1 meter, band limited pink noise from 32-150Hz is 103.5 dB; power handling: 500 watts sine wave and 1,000 watts program, total weight: 51 pounds.

N E W P R O D U C T S

**SPEAKERS
AND MONITORS**

1988

**RAMSDELL AUDIO
DIVISION OF RAMSDELL ENTERPRISES**

PO Box 76186
St. Petersburg, FL 33734
Product Name: BH-1
Contact: Pamela Ramsdell, co-owner
Date Product Introduced: January, 1987
Product Description & Applications: This system is designed for biamped use only with crossover points at 180-250Hz at 24 dB/oct recommended. It is designed for high level sound reinforcement application and is extremely efficient. Its bandwidth, output power-phasing and transient response has to be heard to be believed for a system of its size. This has proven to be the answer to many sound reinforcement needs of our consumers and the word is spreading quickly about this superb system.
Basic Specifications & Suggested List Price: Frequency response: 40Hz-18kHz; sensitivity: 1 watt at 1 meter; power handling: 400 watts low, 250 watts high biamped; dispersion: 100 degrees nominal horizontal, 40 degrees nominal vertical; sensitivity: 106 dB SPL 1 watt at 1 meter.

RENKUS-HEINZ, INC.

17191 Armstrong
Irvine, CA 92714
(714) 250-0166
Product Name: Smart 121 Series Speaker Systems
Contact: Greg McLagan, national sales manager
Date Product Introduced: January, 1987
Product Description & Applications: The Smart 121 Series Speaker Systems include the compact SR-121 full-range system in a trapezoidal cabinet and the W121 stage monitors. With the appropriate Smart Processor, the 12" woofer and 1" high frequency driver on a constant beamwidth horn provide studio monitor quality sound from compact enclosures. With complete dynamic protection against speaker damage from excessive heat or excursion.
Basic Specifications & Suggested List Price: Woofers: 12" 200 watt; HF drivers: 1" 100 watt; HF horn: 90-degree x 50-degree constant beamwidth. Black wear-resistant carpet finish. Optional flypoints available. Contact Renkus-Heinz for additional applications and pricing information.

ROSS SYSTEMS

PO Box 2344
Fl. Worth, TX 76113
(817) 336-5114
Product Name: Hurricane H215CD Speaker System
Contact: Harvey Gerst, director
Date Product Introduced: June 27, 1987
Product Description & Applications: High-power 3-way speaker system for large area sound reinforcement applications. Two Ross LF15 15" speakers in a "Thiele-aligned" vented enclosure. Ross MS08 8" compression driver with 22" x 14" CD mid-range horn. Two Ross HF01 compression drivers/CD high-frequency horns. Three-way 18 dB/oct custom crossover with bi-amp option. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.
Basic Specifications & Suggested List Price: Power handling capacity is 800 watts at 8 ohms impedance. Frequency response is 37Hz to 18kHz. Dimensions: 32"H x 38.25"W x 18"D. Suggested retail \$949.95.

ROSS SYSTEMS

PO Box 2344
Fl. Worth, TX 76113
(817) 336-5114
Product Name: Hurricane H118CD Speaker System
Contact: Harvey Gerst, director
Date Product Introduced: June 27, 1987
Product Description & Applications: Road-ready 3-way speaker system for sound reinforcement where extended low-end is needed. Ross LF18 18" speaker in "Thiele-aligned" vented enclosure. Ross MF08 8" compression driver with 22" x 14" constant directivity mid-range horn. Ross HF01 compression driver/CD high frequency horn. 3-way 18 dB/oct crossover or can be bi-amped. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.
Basic Specifications & Suggested List Price: Power handling capacity is 500 watts at 8 ohms impedance. Frequency response is 40Hz to 18kHz. Dimensions: 40"H x 26.5"W x 18"D. Suggested retail \$749.95.

ROSS SYSTEMS

PO Box 2344
Fl. Worth, TX 76113
(817) 336-5114
Product Name: Hurricane H115 CD Speaker System
Contact: Harvey Gerst, director
Date Product Introduced: June 27, 1987
Product Description & Applications: Efficient 3-way speaker system for sound reinforcement. Ross LF15 15" low frequency speaker in "Thiele-aligned" full scale enclosure. Ross MF08 8" compression driver with a 22" x 14" constant directivity mid-range horn. Ross HF01 compression driver/CD high-frequency horn. 18 dB/oct 3-way crossover. Bi-ampable. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.
Basic Specifications & Suggested List Price: Power handling capacity is 400 watts at 8 ohms impedance. Frequency response is 45Hz to 18kHz. Dimensions: 37"H x 26.5"W x 18"D. Suggested retail \$649.95.

ROSS SYSTEMS

PO Box 2344
Fl. Worth, TX 76113
(817) 336-5114
Product Name: T 183HS "Typhoon" Speaker System
Contact: Harvey Gerst, director
Date Product Introduced: June 27, 1987
Product Description & Applications: High performance 3-way speaker system for PA, monitor, music applications. Ross LF18 18" bottom end driver in "Thiele-aligned" enclosure. Ross MF08 8" direct radiator mid-range. Ross HF01 compression driver/constant directivity horn. High power 3-way 12 dB/oct Linkwitz crossover. Bi-ampable. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.
Basic Specifications & Suggested List Price: Power handling capacity is 300 watts at 8 ohms impedance. Frequency response is 45Hz to 18kHz. Dimensions: 30"H x 24"W x 17"D. Suggested retail \$549.95.

ROSS SYSTEMS

PO Box 2344
Fl. Worth, TX 76113
(817) 336-5114
Product Name: T153 HS "Typhoon" Speaker System
Contact: Harvey Gerst, director
Date Product Introduced: June 27, 1987
Product Description & Applications: High performance 3-way speaker system for PA, monitor, modular bass use. Ross LF15 15" low frequency speaker in "Thiele-aligned" cabinet. Ross MF08 8" direct radiator mid-range. Ross HF01 compression driver/constant directivity horn. Deluxe 12 dB/oct 3-way Linkwitz crossover. Bi-ampable. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.
Basic Specifications & Suggested List Price: Power handling capacity is 250 watts at 8 ohms impedance. Frequency response is 55Hz to 18kHz. Dimensions: 28"H x 23"W x 16"D. Suggested retail \$479.95.

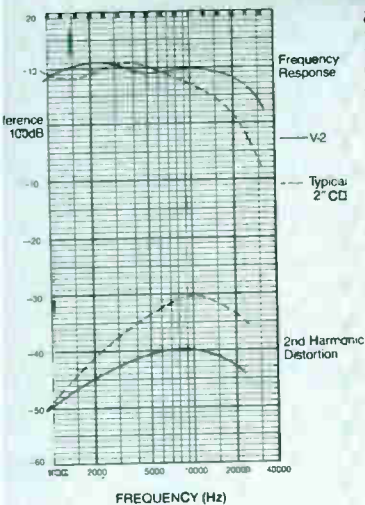
ROSS SYSTEMS

PO Box 2344
Fl. Worth, TX 76113
(817) 336-5114
Product Name: T153 "Typhoon" Speaker System
Contact: Harvey Gerst, director
Date Product Introduced: June 27, 1987
Product Description & Applications: Moderate priced 3-way speaker system for PA, monitor applications. Ross 15" Pro-Series speaker in "Thiele-aligned" cabinet. Ross MF08 8" direct radiator mid-range. Ross HF01 compression driver/constant directivity horn. Built-in 12 dB/oct 3-way Linkwitz crossover. Bi-ampable. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.
Basic Specifications & Suggested List Price: Power handling capacity is 150 watts at 8 ohms impedance. Frequency response is 55Hz to 18kHz. Dimensions: 28"H x 23"W x 16"D. Suggested retail \$399.95.

ROSS SYSTEMS

PO Box 2344
Fl. Worth, TX 76113
(817) 336-5114
Product Name: T-152 HS "Typhoon" Speaker System
Contact: Harvey Gerst, director
Date Product Introduced: June 27, 1987
Product Description & Applications: Deluxe 2-way speaker system for sound reinforcement, monitor use. Features Ross LF15 15" speaker in a "Thiele-aligned" enclosure. HF01 compression driver with 4" x 10" constant directivity horn. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.
Basic Specifications & Suggested List Price: Power handling capacity is 250 watts at 8 ohms impedance. Frequency response is 55Hz to 18kHz. Dimensions: 24"H x 18"W x 17"D. Suggested retail \$349.95.

We don't mind looking a bit ridiculous if it helps make live sound sublime.



Curves have been smoothed for purposes of comparison.

Engineering live sound means solving a multitude of "impossible" problems. Every audience — and every artist — expects great sound. Unfortunately, venues rarely cooperate with those expectations. Fortunately, Turbosound goes to any lengths to develop effective solutions to sound reinforcement problems — even when that entails a total re-examination of fundamental principles.

Our determined refusal to rehash the conventions of enclosure design has led us to develop several patented design principles. And to produce unusual-looking loading techniques like our unrivalled TurboMid™ and TurboBass™ devices. Our search for a solution to the dilemmas of HF projection and distortion has now produced the radically advanced V Series.

V Series combines aspects of manifold technology with Turbosound loading techniques to blend the outputs of multiple drivers gradually, minimizing phase cancellation. The first realization of the V Series principle is the V-2 shown here. Available initially for the T-3 flare in our world-travelling TMS-3 full-range enclosure, this central focussing device couples two custom-built 1" drivers. It extends the TMS-3's HF response to a true -3 dB at 20 KHz, reduces harmonic distortion dramatically and paves the way for the

soon-to-be-released UHQ system, incorporating Turbosound Flash-light™ technology.

The V-2 also solves "impossible" problems of intelligibility without artificial electronic enhancement or extraneous ultra-HF devices. It transmits every nuance of the performance to every seat in the house. And makes live sound more "lifelike" than it's ever been.

Finally, we'd like to point out one more important fact about this unique advance in professional audio performance — the ridiculous-looking part goes *inside* the box.



Only Turbosound is Turbosound.®

Turbosound

an EdgeTech company
LONDON • NEW YORK • TOKYO

Circle #221 on Reader Service Card

*TurboMid™ and TurboBass™ devices are covered worldwide by Principle Patents, not simple design patent. Principle Patents covering V Series have been applied for. The concepts embodied in these designs are, therefore, entirely unique. See Turbosound literature for full information.

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ROSS SYSTEMS

PO Box 2344
Ft. Worth, TX 76113
(817) 336-5114

Product Name: T152 "Typhoon" Speaker System

Contact: Harvey Gerst, director

Date Product Introduced: June 27, 1987

Product Description & Applications: Two-way speaker system for sound reinforcement, stage monitor use. Has Ross 15" Pro-Series speaker in "Thiele-aligned" cabinet. HF01 compression driver with 4" x 10" constant directivity horn. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.

Basic Specifications & Suggested List Price: Power handling capacity is 150 watts at 8 ohms impedance. Frequency response is 55Hz to 18kHz. Dimensions: 24"H x 18"W x 17"D. Suggested retail \$299.95.

ROSS SYSTEMS

PO Box 2344
Ft. Worth, TX 76113
(817) 336-5114

Product Name: T-122 HS "Typhoon" Speaker System

Contact: Harvey Gerst, director

Date Product Introduced: June 27, 1987

Product Description & Applications: Compact, high performance 2-way speaker system for sound reinforcement, keyboard monitoring. Ross Pro-Series 12" speaker in a "Thiele-aligned" enclosure. HF01 compression driver with a 4" x 10" constant directivity horn. Rugged 7-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.

Basic Specifications & Suggested List Price: Power handling capacity is 100 watts at 8 ohms impedance. Frequency response is 60Hz to 18kHz. Dimensions: 21"H x 16"W x 16"D. Suggested retail \$229.95.

ROSS SYSTEMS

PO Box 2344
Ft. Worth, TX 76113
(817) 336-5114

Product Name: T122 "Typhoon" Speaker System

Contact: Harvey Gerst, director

Date Product Introduced: June 27, 1987

Product Description & Applications: Compact 2-way speaker system for sound reinforcement use. Features a Ross 12" heavy-duty speaker in a "Thiele-aligned" enclosure. HF44 compression driver/horn for highs. Rugged 7-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.

Basic Specifications & Suggested List Price: Power handling capacity is 75 watts at 8 ohms impedance. Frequency response is 65Hz to 16kHz. Dimensions: 21"H x 16"W x 16"D. Suggested retail \$179.95.

ROSS SYSTEMS

PO Box 2344
Ft. Worth, TX 76113
(817) 336-5114

Product Name: M122 HS Deluxe Monitor Speaker

Contact: Harvey Gerst, director

Date Product Introduced: June 27, 1987

Product Description & Applications: High performance stage monitor system. 2-way design features a Ross HF01 compression driver coupled to a 10" x 4" CD horn. Ross 12" Pro-Series speaker in bass reflex cabinet covers mids and lows. Heavy-duty dual L-C crossover includes tweeter level control. Seven-ply birch plywood construction. Expanded steel grille.

Basic Specifications & Suggested List Price: Power handling capacity is 100 watts at 8 ohms impedance. Frequency response is 60Hz to 18kHz. Dimensions: 12.5"H x 20.75"W x 12.5"D. Suggested retail \$199.95.

ROSS SYSTEMS

PO Box 2344
Ft. Worth, TX 76113
(817) 336-5114

Product Name: M122 Monitor Speaker

Contact: Harvey Gerst, director

Date Product Introduced: June 27, 1987

Product Description & Applications: Wedge-style floor 2-way monitor system. Features a Ross 12" heavy-duty speaker in a bass reflex enclosure with an HF-44 high frequency compression driver/horn. Dual L-C crossover has tweeter level control. Seven-ply birch plywood construction. Expanded steel grille.

Basic Specifications & Suggested List Price: Power handling capacity is 75 watts at 8 ohms impedance. Frequency response is 70Hz to 16kHz. Dimensions: 12.5"H x 20.75"W x 12.5"D. Suggested retail \$149.95 each.

ROSS SYSTEMS

PO Box 2344
Ft. Worth, TX 76113
(817) 336-5114

Product Name: RSPA Portable Speaker System

Contact: Harvey Gerst, director

NEW PRODUCTS**SPEAKERS AND MONITORS**

1988

Date Product Introduced: June 27, 1987

Product Description & Applications: The RSPA is a compact 2-way speaker system in a pair of cabinets that lock together for transporting. Each cabinet has one Ross heavy-duty 12" speaker and an HF44 high-frequency compression driver, yet measures only 20"H x 19"W x 9.75"D. The two-cabinet pair takes little more than one cu. ft. of space when packed up. Ideal for small to medium size clubs, or as near-field monitors.

Basic Specifications & Suggested List Price: Frequency response is 180Hz to 16kHz. Coverage angle 90 x 40 degrees. Power handling per cabinet is 150 watts program at 8 ohms impedance. Pair \$249.95.

ROSS SYSTEMS

PO Box 2344
Ft. Worth, TX 76113
(817) 336-5114

Product Name: Hurricane H218 CD Speaker System

Contact: Harvey Gerst, director

Date Product Introduced: June 27, 1987

Product Description & Applications: High power 3-way speaker system for sound reinforcement with extended low frequency capability. Two Ross LF18 18" speakers in a "Thiele-aligned" vented enclosure. Ross MF08 compression driver/CD mid-range horn. Two Ross HF01 compression drivers/CD high-frequency horns. 3-way 18 dB/oct custom crossover with biamp option. Seven-ply birch plywood construction with ozite carpet covering and corner/edge protection moldings.

Basic Specifications & Suggested List Price: Power handling capacity is 1,000 watts at 8 ohms impedance. Frequency response is 35Hz to 18kHz. Dimensions: 38.25"H x 38.25"W x 18"D. Suggested retail \$1,049.95.

SOTA INDUSTRIES

PO Box 7075
Berkeley, CA 94707
(415) 527-1649

Product Name: SOTA Monitors

Contact: RS Becker

Date Product Introduced: May/June, 1987

Product Description & Applications: Full-range high resolution monitor small enough for studio work and designed for high end/audiophile monitor work. Focus on imaging, midrange transparency, coherence, smoothness. Easy to drive and easy to place.

Basic Specifications & Suggested List Price: Total size: 9 cu. ft., 45Hz to 20k (+/-3 dB); max distortion, 5% THD; passive radiator (8"); active drivers: 1" dome tweeter, 8" woofer, sensitivity: 91 dB, 1 watt/1 m. \$1,500 Brazilian Rosewood.

STATE OF THE ART ELECTRONIK, INC.

43-1010 Polytek St.
Ottawa, Ontario, K1J 8Z2 Canada
(613) 744-1003

Product Name: CF-750 Acoustic-Align Studio Reference Monitor

Contact: Dr. Claude Fortier

Date Product Introduced: October, 1987

Product Description & Applications: The CF-750 is a 3-way, acoustic align all cone monitoring system designed to provide high SPL levels at full fidelity for use in audio-for-video, post-production and medium to small control rooms. The system may be used for nearfield, stand mounted or wall mounted applications. Designed to be used in conjunction with the AAX-2 electronic crossover system and two power amplifiers. Excellent frequency response with low distortion.

Basic Specifications & Suggested List Price: Driver complement: five drivers, including two 12" woofers, two 6" mid-ranges and a 1" tweeter; power handling: 180+180 watts RMS, 2-way active with 2-way passive to form a 3-way hybrid. Acoustic listening window +/-30 degrees horizontal, +/-10 degrees vertical. Frequency response: 49Hz to 20kHz +/-2 dB on reference axis; nominal impedance: 4 ohms; dimensions: 19.5H x 34.75W x 16.75D.

TANNOY NORTH AMERICA, INC.

300 Gage Ave., Unit #1
Kitchener, Ontario, N2M 2C8 Canada
(519) 745-1158

Product Name: T-300

Contact: Bill Calma, marketing mgr.

Date Product Introduced: June, 1987

Product Description & Applications: A new addition to the highly acclaimed Wildcat Series, the T-300 is a twin 15, direct radiating bass reinforcement system. The T-300 has been designed to work in conjunction with the Wildcat's modular

design and can be operated with its built-in passive X-over network or with external active designs.

Basic Specifications & Suggested List Price: Frequency response: 45Hz-180Hz +/-3 dB; power handling: 500 watts continuous; sensitivity for 2.8V 1M: 103 dB; impedance: 4 ohms; maximum SPL: 130 dB; dimensions: 41.5 H x 28 W x 20 D; weight: 175 lbs.; connection: 2x-XLR; accessories: mounting or hanging straps.

3D ACOUSTICS/A DAHLQUIST CO.

601 Old Willets Path
Hauppauge, NY 11788
(516) 234-5757

Product Name: 3D610 Surround

Contact: Paul Josefson, field support manager

Product Description & Applications: Two pair satellites w/sub-woofer. Sub. has phase-conditioned surround sound matrix incorporated into sub's crossover network. Can be used both with audio or video applications.

Basic Specifications & Suggested List Price: Sub. has 10" woofer (x-over at 100Hz). Satellites have 6" woofer and 1" dome tweeter. 16 ohms nom/10 ohms min. Response 30-20k. 88 dB sens. List \$885/system.

TURBOSOUND INC.

611 Broadway
New York, NY 10012
(212) 460-9940

Product Name: Turbosound

Contact: Dan Abelson, vice president sales & marketing

Date Product Introduced: June, 1987

Product Description & Applications: The TFM-2 high-power floor monitor utilizes patented TurboConcentric™ technology to achieve maximum output from the smallest possible stage monitor. The TFM-2 is loaded with a proprietary bass 15", a mid 15" with the dual concentric Turbo with a proprietary 2" compression driver mounted behind the mid frequency 15" speaker. The output capabilities of the TFM-2 are in the range of 135 dB before distortion.

Basic Specifications & Suggested List Price: The TFM-2 is 20" W x 33" D x 22.5" H. Power-handling: bass section 250 watts, 8 ohm section, mid/high section: 300 watts, 8 ohm section, continuous RMS. Suggested list price \$2,400.

UREI

8500 Balboa Blvd.
Northridge, CA 91329
(818) 893-8411

Product Name: C-Series Monitors

Product Description & Applications: UREI's C Series studio monitors, featuring Time Alignment to solve "time smear," provide high sensitivity to input signals and high power handling. The three models in the series each use a new coaxial loudspeaker combined with a titanium-diaphragm compression driver, two models use additional low frequency drivers. The monitors incorporate a patented high frequency horn with diffraction buffer, and special slots to eliminate midrange shadowing. The C Series feature a BNC connector on the crossover's rear panel to accommodate UREI's 6500 power amplifier conductor compensation.

WESTLAKE AUDIO MANUFACTURING GROUP

2696 Lavery Ct., Bldg. 12
Newbury Park, CA 91320
(805) 499-3686

Product Name: BBSM-15

Contact: Glenn Phoenix

Date Product Introduced: March, 1987

Product Description & Applications: The Westlake BBSM-15 is a 3-way, high power, phase coherent monitor with internal crossover (active biamp crossover optional). Configuration: two 15" ported woofers, 10" cone midrange in separate sealed enclosure, 2" compression driver, horn loaded tweeter. Designed for free standing or soffit mounting; utility black and oiled walnut versions available.

Basic Specifications & Suggested List Price: Impedance: 4 ohms; frequency response: ±3dB 34 to 15k Hz (flush mounted); efficiency: 99dB SPL 1W/1m; crossover points 350, 1.6k Hz (RLC slope 24dB/oct minimum); weight: 345 pounds.

YAMAHA INTERNATIONAL CORPORATION

PO Box 6600
Buena Park, CA 90622
(714) 522-9011

Product Name: NS-10M Studio Version

Contact: Professional Audio Division

Date Product Introduced: January, 1987

Product Description & Applications: The studio version of the 2-way NS-10M speaker system is designed for near-field monitoring, and refined for optimum balance in the control room. Along with the original NS-10M's 18 cm, white cone woofer, the update has a new 3.5 cm dome tweeter for high-end response more suitable for studio use. The original vertical design has been replaced with a horizontal one for easy console placement, and overall construction is more rugged.

Basic Specifications & Suggested List Price: The NS-10M Studio Version features superior transient response and a frequency response from 60 to 20k Hz.

NEW PRODUCTS

TEST AND MAINTENANCE GEAR

1988

AMBER ELECTRO DESIGN INC.
4810 Jean Talon W., Ste. 321
Montreal, H4P 2N5 Canada
(514) 735-4105

Product Name: Model 5500 Programmable Audio Measurement System
Contact: Wayne Jones, president
Date Product Introduced: New measurement options, 1987
Product Description & Applications: The Model 5500 is a high performance programmable audio generator, level meter, noise meter and distortion meter. With state-of-the-art performance, high speed operation and comprehensive measurement capabilities, the 5500 can measure virtually every audio parameter in seconds. The AudioCheck™ software package permits an IBM PC/XT/AT or compatible to control test sequences using the 5500 and produce test reports, graphs, pass/fail decisions etc.

Basic Specifications & Suggested List Price: Frequency range 10Hz to 100kHz; level measurement range, +40 dBm (100V) to -120 dBm (1μV); system THD+N below 0.001% (-100 dB); generator output +30 dBm to below -100 dBm; stereo balanced input, optional stereo balanced output. Basic price U.S. \$6,500 plus options

AMBER ELECTRO DESIGN INC.
4810 Jean Talon W., Ste. 321
Montreal, H4P 2N5 Canada
(514) 735-4105

Product Name: Model 3501 Distortion & Noise Measuring System
Contact: Wayne Jones, president
Date Product Introduced: New measurement options, 1987
Product Description & Applications: The Model 3501 is a high performance audio generator, signal level meter, noise meter and distortion analyzer. The portable system is smaller than a briefcase and less than 20 lbs with an optional internal rechargeable battery. Includes a unique narrow band measurement feature and can be fitted with a fully balanced input and output. Several measurement and noise weighting options are also available.

Basic Specifications & Suggested List Price: Frequency range 10Hz to 100kHz; level measurement +40 dBm (100V) to -120 dBm (1mV); THD+N to below 0.0008% (-102 dB); noise to below -120 dBm (1μV); generator output up to +30 dBm balanced 6 00 ohms. Basic instrument U.S. \$2,600 plus options.

APOGEE ELECTRONICS CORP.
1517 20th St.
Santa Monica, CA 90404
(213) 828-1930

Product Name: Audioscope Model 9000 Integrated Audio Information Display Mainframe
Contact: Betty Bennett, sales
Date Product Introduced: November, 1987
Product Description & Applications: This powerful new video system displays up to 96 analog or digital audio input channels, graphically presenting audio PPM and VU level, fader automation level, comprehensive spectrum analysis and reverbation time analysis.

Basic Specifications & Suggested List Price: System outputs RS232 (graphic printer, etc.); display: external color monitor (analog RGB), size: three rack units; audio inputs: 96 max., (analog, digital, de); modules: 1) third octave spectrum analyzer, 2) pink/white noise generator, oscillator, 3) PM/VU audio level meter, 4) automation level indicator, 5) frequency response curve plotter, 6) rever-time analyzer; computer interface RS232.

AUDIO CONTROL INDUSTRIAL
6520 212th SW
Lynnwood, WA 98036
(206) 775-8461

Product Name: SA-3050A Real Time Analyzer
Contact: Tom Walker, president
Date Product Introduced: August, 1987



AUDIO CONTROL INDUSTRIAL
SA-3050A Real Time Analyzer

Product Description & Applications: Affordable 1/3-octave real time spectrum analyzer with six memories, pink noise generator, on-screen digital SPL display, memory averaging and peak hold capability. Fourth order filters to ANSI class II inputs from supplied calibrated microphone and XLR input or BNC and 1/4" inputs. Parallel printer driver optional. Memories are nonvolatile. Fast, medium and slow display speeds. Rack mount available

Basic Specifications & Suggested List Price: 30 bands ISO centers 25 to 20k Hz, ANSI class II filters, display 30 x 9 LED matrix, resolution 1, 2, 3, or 4 dB/step, display centerline 70 to 120 dB at 10 dB steps, acoustical signal level 44 to 136 dB SPL, 4" x 10" x 12.75", overall size, weight 8 pounds. Price \$965, printer driver \$110, rack mount \$55, carrying case \$59

AUDIO CONTROL INDUSTRIAL
6520 212th SW
Lynnwood, WA 98036
(206) 775-8461

Product Name: BP-10 Battery Pack
Contact: Tom Walker, president

Date Product Introduced: May, 1987
Product Description & Applications: Internal rechargeable battery pack for SA-3050 real time analyzer. Sealed lead-acid, gel cell type. Charging automatic when plugged into line voltage. Completely self-contained within SA-3050 A chassis, low battery warning light.

Basic Specifications & Suggested List Price: Five to 6-hour operation on full charge, charge time approximately double discharge time, long life sealed lead acid, expected cycle life, 1,500-2,000 cycles, float life 8 years, excellent storage characteristics. Price \$195 factory installed.

AUDIO PRECISION, INC.
PO Box 2209
Beaverton, OR 97075
(800) 231-7350
(503) 627-0832

Product Name: BUR-GEN option
Contact: Adolfo Rodriguez, prod. mktg. mgr.
Date Product Introduced: March, 1987

Product Description & Applications: Waveform generation option for System One. Pink noise, white noise, narrow-band noise, tone burst with programmable "off" level, squarewave. For acoustical and loudspeaker testing, compressor testing, transient testing.

Basic Specifications & Suggested List Price: \$965

AUDIO PRECISION, INC.

PO Box 2209
Beaverton, OR 97075

(800) 231-7350
(503) 627-0832

Product Name: DCX-127 Multi-function Module
Contact: Adolfo Rodriguez, prod. mktg. mgr.

Date Product Introduced: March, 1987

Product Description & Applications: Accessory to System One audio test system, adds DC voltage and resistance measurement, two programmable DC voltage outputs, 21-bit digital words in and out, three 8-bit ports for logic and relay control.

Basic Specifications & Suggested List Price: 4½ digits, +/- 0.05%, DC outputs controllable with 20-bit resolution \$2,150

AUDIO PRECISION, INC.

PO Box 2209
Beaverton, OR 97075

(800) 231-7350
(503) 627-0832

Product Name: System One, A-Version

Contact: Adolfo Rodriguez, prod. mktg. mgr.

Date Product Introduced: December, 1986

Product Description & Applications: Improved version of System One audio test system featuring better selectivity in spectrum analysis mode, simultaneous amplitude measurements on both stereo channels, plus harmonic and intermodulation distortion, phase, frequency, wow and flutter. For all audio test applications

Basic Specifications & Suggested List Price: 0.001% residual distortion, generator amplitude range +30 to -90 dBm, +/- 0.05 dB flatness. Price range \$6,650 to \$9,000, depending on options

B & K PRECISION/DYNASCAN CORP.

6460 W. Cortland
Chicago, IL 60635

(312) 889-9087

Product Name: MTS TV Stereo Generator Model 2009

Contact: Martin Plude, mgr. mkt. plng. & comm.

Date Product Introduced: September, 1986

Product Description & Applications: Provides TV stereo and SAP test signals, simulates dbx modulation at three frequencies, used for servicing stereo TV receivers, VCRs and TV stereo adapters

Basic Specifications & Suggested List Price: Manufacturer suggested user price \$495

CETEC IVIE

1366 West Center
Orem, UT 84057

(801) 224-1800

Product Name: PC-40 Computer Controlled Spectrum Analyzer

Contact: Glen E. Meyer

Date Product Introduced: August, 1987

Product Description & Applications: Ivie will be showing its new portable computer-controlled 1/3-octave spectrum analysis system and precision sound level meter, the PC-40. Some of its features include a Type 1 sound level meter that provides fast, slow, peak and impulse measurements, 20 nonvolatile memories for storing or accumulating data, up to a 64 dB display range with resolutions of 1, 2 or 3 dB per step, Class III Filters; serial and parallel outputs, can display two or more curves simultaneously, optional plug-in cartridge printer, AC voltmeter, tape drive, modem or PROM burner, and in addition to its built-in functions, it is user programmable in BASIC, making its capabilities almost limitless.

Basic Specifications & Suggested List Price: Suggested list price is \$4,996 which includes fast charge nickel cadmium batteries, manuals, AC adaptor/charger, microphone preamp, 1/2" air condenser microphone, test probe and carrying case.

DBX

71 Chapel St.
Newton, MA 02195

(617) 964-3210

Product Name: RTA-1, Pro Real Time Analysis System

Contact: John Steinberg, pro NSM

Date Product Introduced: July, 1987

Product Description & Applications: The RTA-1 lets you perform precise and comprehensive sonic analyses of signals and noise as well as rooms, equipment and transmission media, using the music itself as the test signal. You can make measurements during system setup, sound checks, tape recording or broadcasting, all while program material is actually playing. Offers frequency-response analyses using music, the unit's own stereo (uncorrelated) pink noise or tones, precision 1/3-octave topology using triple-tuned (IEC class 3) filters, ISO-centered 31 bands (20Hz-20kHz), 0.3 dB resolution, 100+ dB dynamic range, dbx true RMS-level detection, analyses performed in real time, battery-backup memories have averaging, subtracting, inverting or normalizing capabilities; A, C or CCIR-ARM weighting or flat; selectable display range,

—CONTINUED ON NEXT PAGE

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NEW PRODUCTS

TEST AND MAINTENANCE GEAR

1988

—CONTINUED FROM PAGE 287

accumulation with variable time constants including exclusive "forever" averaging, help screens at the touch of a button, easy-to-use menu-driven operating system with flexible (8088) microprocessor-based architecture, high-resolution, high-visibility amber CRT display, output for color monitor (IBM EGA standard), RS232 and Epson FX80 (or equivalent printer) ports for PC compatibility, mic preamps built-in with 48 V phantom power supply and automatic calibration. Basic Specifications & Suggested List Price: \$8,000

FURMAN SOUND, INC.

30 Rich St.
Greenbrae, CA 94904
(415) 927-1225

Product Name: VU-40 Stereo System Monitor
Contact: Joe Desmond, national sales manager
Date Product Introduced: June 27 1987

Product Description & Applications: The VU-40 is a convenient rack mount dual-channel Power Output or Line Level metering device. It is comprised of two 20 LED bargraph meters, calibrated in dB-like standard VU meters, and also in watts. They may be set for either peak or average response. There is a choice of 16 power out sensitivities, and two for line level. A special bonus feature is turn-on/turn-off transient muting of any signals routed through the VU-40. Comes with 1/4" phone and banana jacks, available with optional XLR connectors for balanced systems.

Basic Specifications & Suggested List Price: Line-in/out input impedance greater than 200k ohms. Sensitivity for 0 VU either -10 or 0 dBV. Turn-on delay is approximately one second, maximum through level +20 dBV. Power amp inputs: sensitivity for 0 VU, 16 selectable levels from 25 to 400 watts at 8 ohms, or 50 to 800 watts at 4 ohms. Suggested list price \$199



**GOLD LINE
ASA30B**

GOLD LINE

PO Box 115
W. Redding, CT 06896
(203) 938-2588

Product Name: ASA30B

Contact: Marj Miller, sales mgr
Date Product Introduced: April, 1987

Product Description & Applications: Model ASA30B is a professional 1/3-octave real time audio spectrum analyzer at an affordable retail price of \$599.95. This portable RTA excels in sound reinforcement, room equalization and the elimination of feedback. The ASA30B is a superior dBmeter and provides accurate sound pressure level measurements in either "A" or "C" weighting. Units have proved useful to broadcasters for their cart machines and are in use in studios as a programmed energy balance meter to help determine which frequencies are driving the mix level.

Basic Specifications & Suggested List Price: The ASA30B lists for only \$599.95. Features include: 30 bands on ISO centers with ANSI Class II filter, accurate sound pressure level readings from 30 dB to 123 dB SPL, flat, "A" or "C" weighted curves and a hold mode. Measurements can be made with the built-in instrument quality microphone or via a line input. Power is supplied by a 12-volt rechargeable 1.2 amp hour gel cell battery.

HEWLETT-PACKARD COMPANY

1620 Signal Dr.
Spokane, WA 99220
(509) 922-4001

Product Name: HP8904A Multifunction Synthesizer
Contact: Ken Thompson, product manager

Date Product Introduced: September 1, 1987

Product Description & Applications: The HP8904 creates complex signals from six simple waveforms. It begins with a synthesizer/function generator with sinewaves, square, ramp and triangle waveforms and DC and noise. An option adds another output for a second synthesizer. Another option adds three synthesizers which can either modulate the first synthesizer or be summed to the output. Modulation capabilities include AM, FM, 0M, DBS and pulse. Specific signals include FM stereo where all parameters can be varied independently.
Basic Specifications & Suggested List Price: Sinewave: 1Hz - 600kHz; square, ramp, triangle: .1Hz - 50kHz; Gaussian white noise, DC; resolution: .1Hz; amplitude: 140 uV - 10Vp-p, spectral purity: THD+N: -60 dBc (20Hz-20kHz); phase (sinewave) range: 0 to 359.9 degrees

HIGH FIDELITY CONCEPTS INC.

3392 Crawford St. SE
Salem, OR 97302
(503) 363-1586

Product Name: Concepts Model #DM-1

Contact: Cameron D. Jones, president

Date Product Introduced: December, 1987

Product Description & Applications: The DM-1 is a precision sound pressure level measurement device. A three-digit LED display indicates sound intensity in decibels. Measurements can be made flat, or using the internal ASA A and C weighting networks. The measurement can be displayed as peak or average intensity.

Basic Specifications & Suggested List Price: SPL measurement range: 70-115 dB; display resolution: 1 dB; maximum measurement error: +/- 1/2 dB. Suggested list price \$179.95, \$195 with AC power supply.

HOWE TECHNOLOGIES CORPORATION

2300 Central Ave., Ste. E
Boulder, CO 80301
(303) 444-4693
(800) 525-7520

Product Name: The Howe "Broadcast" Phase Chaser

Date Product Introduced: September, 1987

Product Description & Applications: It is a monitoring and correction tool for time base errors on discrete stereo channels. Compatible with all audio machines and video machines. Also corrects polarity inversion and channel dropout. Applications are AM/FM stations, TV stations, movie theaters, video houses compatible with Dolby-encoded material and post-production houses.

Basic Specifications & Suggested List Price: Corrects plus or minus 150 microseconds and flat frequency response beyond 20k. Price is \$2,895.



JASONI ELECTRONICS
TAS-1000 Audio Tape Analyzer

JASONI ELECTRONICS

2900 E. Charleston Blvd., Ste. 197
Las Vegas, NV 89104
(702) 384-0081

Product Name: Audio Tape Analyzer (TAS-1000)

Contact: Dan G. Peluso

Date Product Introduced: Updated 1987

Product Description & Applications: The TAS-1000 tape analyzer is cost effectively designed to align, calibrate, and set up all analog audio tape equipment. It will read noise down to -70 dBm. It features a pink noise generator for error free stereo alignment. A low distortion sine wave oscillator that is frequency selected manually or auto sweep with a variable sweep

control. A BNC connector is available for the use of a digital frequency counter. The TAS-1000 is a must for every recording studio.

Basic Specifications & Suggested List Price: The TAS-1000 is a compact, self contained audio analyzer that plugs into your tape equipment for quick checks, and complete alignment of mono and stereo tape recorders/reproducers, i.e., tape cartridge, reel to reel, and cassette. Designed for broadcast, recording, service and industrial use. A must for every recording studio. Mfg. list \$789

JVC COMPANY OF AMERICA

PROFESSIONAL VIDEO COMMUNICATIONS DIV.
41 Slater Dr.
Elmwood Park, NJ 07407

(800) JVC-JVC-5

Product Name: DS-DA900 Digital Tape Checker

Contact: Larry Boden, special product mgr., JVC

Date Product Introduced: June 1, 1987

Product Description & Applications: The DS-DA900 lets users check and measure exact conditions of a master tape before beginning the digital mastering process. This is an essential practice today and the DS-DA900 makes it quick, easy and accurate with automatic error-free checking and measurement capabilities.

Basic Specifications & Suggested List Price: Standard features include automatic start/stop times for those conditions users wish to measure and check, hard copy printouts of the results and output measurements through an RS-232C port. Connecting to the RS-232C port allows users to connect the DAS 900 to a workstation, handling data from the workstation as needed. Price available by contacting Larry Boden (213) 537-6020

KINTEK, INC.

224 Calvary St.
Waltham, MA 02154
(617) 894-6111

Product Name: KT-932 Audio Phase Meter

Contact: John J. Bubbers, product manager

Date Product Introduced: March, 1986

Product Description & Applications: The KT-932 Audio Phase Meter is a frequency and amplitude blind meter to measure phase of individual audio components or systems. It can also be used to monitor program phase and correlation. It is calibrated in 1-degree increments to 30 degrees and 6-degree increments to 180 degrees. It can monitor phase to predict loss of mono in systems employing sum and difference trans-

—CONTINUED ON NEXT PAGE

What Tape Problems?

When I used to make tape masters for CDs, I'd cross my fingers and hope they would be good. Now I pre-inspect each and every tape on the RTI TapeChek™ Evaluator/Cleaner before I ever use it. TapeChek has more than paid for itself in just a couple of months...by identifying brand new tapes that were defective before we wasted hours of expensive time! The TapeChek precision cleaning and polishing removes dust, dirt and loose oxide that causes temporary dropouts. It improves the tape's S/N ratio, so our end result is far superior. We're a step ahead of the competition... because our customers know we can do it faster and better. TapeChek adds confidence to our work.

Thanks RTI!

RTI TapeChek Videotape Evaluator/Cleaners are available for 1" B & C, 3/4" U-Matic, 1/2" Beta/Betacam and VHS/Hi8 Formats.

See us at AES Booth #953, Sheraton Center

RTI RESEARCH TECHNOLOGY INTERNATIONAL

4700 Chase Avenue Lincolnwood, IL 60646-1689

Call Toll-Free 800/323-7520 or 312/677-3000 for more information...TODAY!

Circle #223 on Reader Service Card

NEW PRODUCTS

TEST AND MAINTENANCE GEAR

1988



KINTEK, INC
KT-932 Audio Phase Meter

mission format such as FM and TV stereo. It is ideal for stereo machine alignment.

Basic Specifications & Suggested List Price: The KT-932 is designed for rack mount 1.5" height. The LED display has an intensity control to adjust to the ambient light level. The graphics are designed for easy reading in any lighting situation. Suggested list price is \$595, FOB Waltham, MA.

MENLO SCIENTIFIC
39 Menlo Pl.
Berkeley, CA 94707
(415) 528-1277
Product Name: Sigma System RS-4000A
Contact: Mike Klasco, president
Date Product Introduced: May 1987

Product Description & Applications: Real time 1/3-octave spectrum analyzer, RT60 timer, digital scope (time alignment), 3-D spectral decay and optional hi-res FFT analyzer.
Basic Specifications & Suggested List Price: 20-20kHz ANSI S1 11 filters. Apple II software compatible. 9" monitor, two disk drives built-in, \$5,000.

ROH
913 W. 223rd St.
Torrance, CA 90502
(213) 533-5984

Product Name: 191X-16 Expander Panel
Contact: Dan Garrigan, director of marketing
Date Product Introduced: April, 1987
Product Description & Applications: ROH's 191X-16 is a 16 x 1 audio bridging switcher designed as an accessory to the 191B Series of Audio Line Monitors/Bridging Switchers. The 191X-16 provides eight mono inputs in addition to the eight inputs on the 191B 08TS and 16 inputs on the 1910B-16T. A stereo version, the 192X-16, will be available in October, 1987.
Basic Specifications & Suggested List Price: Input impedance 10k ohm balanced bridging, switch attenuation greater than 70 dB at 10kHz, maximum input level +30 dBm, power requirement external +/-15VDC (provided by any 191B), size 1.75" H x 19" W x 11.5" D. Pro net price \$1,200.

NOISE REDUCTION FOR UNDER \$10.

MIXING CONSOLES

SWITCHES

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BATTERY CONTACTS



ALL PLUGS & JACKS
(XLR, PHONE, PHONO, DIN, MIDI, ETC.)

PATCHBAYS

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TERMINAL STRIPS

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CRAMOLIN®

Even the finest equipment in the world can't guarantee a noise-free recording. One "dirty" connection anywhere in the electrical path can cause unwanted noise or signal loss.

"MORE THAN A CONTACT CLEANER"

CRAMOLIN® is a fast-acting, anti-oxidizing lubricant that cleans and preserves all metal surfaces, including gold.

When applied to metal contacts and connectors, **CRAMOLIN®** removes resistive oxides as it forms a protective molecular layer that adheres to the metal surfaces and maintains maximum electrical conductivity.

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Boeing	John Fluke Mfg.	Motorola	RCA
Capitol Records	McIntosh Labs	NASA	Switchcraft

SINCE 1956

CAIG LABORATORIES INC.

1175-O Industrial Ave., (P.O. Box J) - Escandido, CA 92025-0051 U.S.A. - (619) 743-7143

RTI RESEARCH TECHNOLOGY INTERNATIONAL
4700 Chase Ave.
Lincolnwood, IL 60646
(800) 323-7520
(312) 677-3000

Product Name: Tape Chek™ Videotape Evaluator/Cleaner
Contact: T. Tisch, VP sales
Date Product Introduced: 1987
Product Description & Applications: Identifies defective tapes before you waste expensive time and money recording on them. Precision cleaning and polishing removes loose tape oxide, dust, dirt and other contamination to reduce temporary dropouts by up to 90%. Improves tape's S/N ratio, so your end result is far superior.
Basic Specifications & Suggested List Price: Inspects, cleans, polishes and rewinds videotapes at up to 20 times standard speed, with optional erase capability and hard copy printer.

SOUND TECHNOLOGY, INC.
1400 Dell Ave.
Campbell, CA 95008
(408) 378-6540

Product Name: 3000 Series Programmable Transmission/Audio Test System
Contact: Cindy Alderson, sales & marketing
Date Product Introduced: May, 1987
Product Description & Applications: Clean, low distortion audio generator outputs sinewave, squarewave, SMPTE IM toneburst, sine step signals. Analyzes flat or filtered level, S/N ratio, channel separation, phasing, IMD, THD. Notch lock feature for measuring noise in the presence of a low level signal (e.g., quantization noise). Two-channel, balanced, fully programmable via front panel, bus controllable, standard printer port. Generator communicates with analyzer through the line you are testing via FSK signals. Runs complete proof-of-performance in approximately 60 seconds.
Basic Specifications & Suggested List Price: Outputs frequencies of 1Hz to 102.39kHz, levels of +30 to -90dBm into 600 ohms, balanced or unbalanced. Frequency accuracy of 0.3% fixed parameters. THD less than 0.01%. Selectable load resistance of 50 ohms to 99,999 ohms. Starts at \$8,950 for the set (generator and analyzer).

SOUND TECHNOLOGY, INC.
1400 Dell Ave.
Campbell, CA 95008
(408) 378-6540

Product Name: MSAT Multichannel Switching System
Contact: Cindy Alderson, sales & marketing
Date Product Introduced: October, 1986
Product Description & Applications: Allows for high-speed testing of multi-channel audio and video equipment and signal distribution systems. Applications include any time you have more than two audio channels to test multi-channel tape machines, broadcast routing switchers, recording patchbays, broadcast and recording consoles, etc. Starts with a system having as few as 8 x 1 channels and expands to as many as 1,664. Choose mode of operation: manual control, stand-alone automation, or external control via GPIB or RS232 bus.
Basic Specifications & Suggested List Price: Switches balanced or unbalanced lines, hermetically sealed, nitrogen filled relays. Frequency bandwidth DC to 1MHz, min/max voltage residual noise (µV) to 500V, relay cycle life greater than 1,000,000 cycles, max current pass-through less than 350mA, input isolation, better than 90dB to 20kHz. Systems available for \$3,400.

Circle #224 on Reader Service Card

OTHER EQUIPMENT

1988

AARMOR CASE CO.

2100 Lapo Rd.
Lake Odessa, MI 48849
(616) 374-5431

Product Name: "Rack Pod"

Contact: Steve Callin

Date Product Introduced: April, 1987

Product Description & Applications: The "Rack Pod" is an integrally molded electronics rack case. It is designed for medium and heavy-duty shipping applications. The "Rack Pod" is available in various colors and with a number of options.

Basic Specifications & Suggested List Price: The "Rack Pod" 6-20 has six rack units with a 20" main body depth. The "Rack Pod" 6-20 weighs 22 lbs. The approximate retail price is \$250

AMCO ENGINEERING CO.

3801 Rose St.
Schiller Pk., IL 60176
(312) 671-6670

Product Name: Control Consoles

Contact: Robert C. Komarek, director of marketing

Date Product Introduced: November, 1986

Product Description & Applications: New catalog features many new items to facilitate equipment mktg. and operational conveniences. 118-pg. four-color cat. graphically and technically presents the product in such detail that there remains no doubt to the product function and capabilities being offered. As an aid in ordering, a five-page ordering guide and check sheet is included. This product, is used in broadcasting, telecommunication and other electronic applications requiring consoles, cabinets and racks.

Basic Specifications & Suggested List Price: Complete price list and details supplied in above lit.

APEX MACHINE COMPANY

3000 NE 12th Terr.
Ft. Lauderdale, FL 33334
(305) 566-1572

Product Name: Cassette Packaging Machine

Contact: Bob Coningsby, sales executive

Date Product Introduced: October 17, 1987

Product Description & Applications: Apex will introduce and exhibit for the first time their new fully automatic cassette packaging machine. This machine will automatically feed paper inserts and cassettes into the standard Norelco box at speeds in excess of 40/min.

Basic Specifications & Suggested List Price: The Apex Cassette Packaging Machine will accept a wide variety of different style inserts and is mainly designed for small and medium size duplicating facilities. The complete unit will sell for less than \$20,000 U.S.

APEX MACHINE COMPANY

3000 NE 12th Terr.
Ft. Lauderdale, FL 33334
(305) 566-1572

Product Name: VHS, Beta, 8mm and R-DAT Cassette Printing Machine

Contact: Bob Coningsby, sales executive

Date Product Introduced: October 17, 1987

Product Description & Applications: Apex will exhibit for the first time ever their new video and R-DAT cassette printing machine. This incredible machine allows duplicators to print title, etc. on their video and R-DAT cassettes, thus eliminating expensive paper labels.

Basic Specifications & Suggested List Price: The video and R-DAT rotoscreen machine is fully adjustable to accept VHS, Beta, 8mm and R-DAT cassettes. Capable of feeding, printing and drying over 60 cassettes per minute.

APOGEE ELECTRONICS CORP.

1517 20th St.
Santa Monica, CA 90404

(213) 828-1930

Product Name: Apogee 944-S and 944-G Linear Phase Anti-Aliasing Filters

Contact: Betty Bennett, sales

Date Product Introduced: March, 1987

Product Description & Applications: The 944-S and 944-G low pass filters are a family of anti-aliasing/anti-imaging low pass filters designed to achieve accurate band limiting in digital audio systems. High stop band attenuation maintains excellent protection from aliasing signal components. Using the Apogee filters greatly reduces dispersion through linear phase design (constant group delay), minimal pass band ripple, optimized roll-off, low distortion and increased slew rate, resulting in exceptional sonic transparency.

Basic Specifications & Suggested List Price: Choice of filters with "sharp" (944-S) or gentle (944-G) pass band/stop-band transition. Linear phase response, +/-5 deg deviation from linear phase in the audio band from 20-20kHz. Very low distortion: 0.03%, large dynamic range: 110 dB. The filters are pin compatible with the specifications of the filters currently used in digital multi-track tape recorders. Price \$90.

APPLIED CREATIVE TECHNOLOGY INC.

10529 Olympic Dr., #101
Dallas, TX 75220

(214) 358-4800

Product Name: DB8 8-channel Console Interface

Contact: Tim Wilde

Date Product Introduced: April, 1987

Product Description & Applications: The new DB8 8-channel Console Interface is specifically designed to adapt the outputs of keyboards, drum machines and samplers to your console's low-Z balanced mic inputs economically and with full fidelity. The DB8 also gives you freedom to locate instruments some distance from the console without signal degradation. Equal to eight low-noise transformerless direct boxes in a single rack mount chassis.

Basic Specifications & Suggested List Price: Eight channels with standard 1/4" phone jack inputs and 3-pin male XLR outputs. (1.75" high) half-rack space chassis, freq. response 10Hz to 25kHz +/-0.2 dB, max. input level of +10.5 dB, S/N ratio >93 dB, red LED clipping indicators. Suggested retail price \$595.

AUDICO, INC.

219 Crossen Ave.
Elk Grove, IL 60007

(312) 640-1030

Product Name: Video Cassette Tape Loader/Reloader for 8mm, M-II, Betacam & 19mm

Contact: Bill Hinkle

Date Product Introduced: March, 1987

Product Description & Applications: Single system can be equipped to load 8mm, M-II, Betacam and 19mm (D format), as well as U-matic, VHS and Beta cassettes. To change from one format to another takes less than 5 minutes. Reload feature allows users to conveniently re-use cassette housing. Used and damaged tape is removed without taking the housings apart, and new tape is loaded in the exact length required. Cassettes can also be rapidly re-wound, and the length of the tape in the cassette verified. The same system can also be equipped to load audio cassettes, carts and reels.

Basic Specifications & Suggested List Price: Prices range from \$5,550 to \$12,000 depending on the number of formats needed and the features.

AUDIOLAB ELECTRONICS, INC.

5831 Rosebud Ln. Bldg. P
Sacramento, CA 95841

(916) 348-0200

Product Name: TD-1B, TD-4A, TD-5

Contact: Ronald A. Stefan, mktg. mgr.

Product Description & Applications: The TD-1B, TD-4A and TD-5 tape degaussers from Audiolab Electronics, Inc. are bulk erasers for use with any kind of magnetic media up to 2" in width and 16" in diameter including: audio, video, computer

diskettes, data tapes, magnetic films, cartridges and cassettes. Audiolab tape degaussers return the media to its original "virgin" state, untouched and unformatted, just as if it were brand new. This is a must if you are looking to achieve the greatest signal-to-noise ratio. Audiolab degaussers can erase better than -90 dB insuring that the user will get a better recording and will allow the correct use of a tape again and again over the course of its entire physical life.

Basic Specifications & Suggested List Price: All models are available in 115 or 230 VAC, 50 or 60 Hz versions. The TD-1B retails for \$119, the D-4A for \$895, and the TD-5 for \$995. All three products are available from Audiolab Electronics, Inc., 3725 Esperanza Dr., Sacramento, CA, 95864, (916) 348-0200. Ask for Ron Stefan.

AVSC, INC.

1880 Embarcadero Rd.

Palo Alto, CA 94303

(415) 493-3814

Product Name: Model 1500/M Bulk Video Tape Eraser

Contact: Veldon Leverich

Date Product Introduced: April, 1987

Product Description & Applications: Heavy-duty automatic bulk videotape eraser designed to erase metal tape with a coercivity of 1,500 Oersted. Will handle all tape formats from 1/2" cassettes to 1" open reel. Automatically erases tapes by moving the tape through a strong field, while electronically diminishing the field with a precisely controlled gradual decay.

Basic Specifications & Suggested List Price: Size 25.5" wide x 30.5" long x 15" high; weight: 295 lbs. 115 VAC or 220 VAC, 50 or 60 Hz. Thermal overload protection. Price \$6,495

BOGEN COMMUNICATIONS, INC.

50 Spring St., PO Box 575

Ramsey, NJ 07446

(201) 934-8500

Product Name: PI-35 High-Powered Intermcom

Contact: D. Pear, Dir. of Communications

Date Product Introduced: January, 1987

Product Description & Applications: PI-35 provides facilities for instant, 2-way communication with up to 25 loudspeaker-equipped locations, which can reply hands-free. PI-35 can also distribute paging announcements, as well as background music from an external source. Emergency announcements require only pressing a single push-button. Dual channels permit communication with any loudspeaker location without interrupting program distribution to others. Front panel includes simple instructions and color-coded guides. Executive-style cabinet is only 8.5" high.

Basic Specifications & Suggested List Price: Rated output (RMS): program 35 W, intercom 8 W; inputs: 2 lo-Z balanced mic, convertible to hi-Z, hi-Z unbalanced aux., hi-Z booster, output: balanced 25 VCT line; power requirements: 120 V, 60Hz AC, 100 W maximum, dimensions: 8.5"H x 20.5"W x 11"D; weight: approx. 20 lbs, finish: cabinet: simulated walnut veneer, panels: sand; suggested list price: \$1,811.25

BROADCAST VIDEO SYSTEMS LTD.

40 W. Wilnot St.
Richmond Hill, Ontario, L4B 1H8 Canada

(416) 764-1584

Product Name: Masterkey™

Contact: Bert Jerwey, G.M.

Date Product Introduced: March, 1987

Product Description & Applications: A stand-alone, composite keyer which can be operated in a controlled linear mode to produce smooth, seamless inlay of DVEs, paint boxes and anti-aliased character generators into program video. For keying situations requiring difficult separation of foreground and background. Masterkey may be switched to "fast" mode allowing its unique "sliding window" to differentiate down to a 5 IRE level difference, anywhere in the grey scale. Mix-to-key or cut-to-key.

Basic Specifications & Suggested List Price: Electronics: one rack unit; remote panel: 5" x 7"; supplied with 25' control cable. Price \$2,900

BROADCAST VIDEO SYSTEMS LTD.

40 W. Wilnot St.
Richmond Hill, Ontario, L4B 1H8 Canada

(416) 764-1584

Product Name: DS-600 Digital Store

Contact: Bert Jerwey, G.M.

Date Product Introduced: March, 1987

Product Description & Applications: The DS-600 will digitize, store and retrieve complete control panel settings of color correctors, switchers, proc amps, TBCs. Contains a 1,000-page memory, each page capable of storing 16 analog functions and 16 on-off functions. A single-page buffer allows any existing stored setup to be easily copied to other pages in memory. Battery backup of main memory.

Basic Specifications & Suggested List Price: Analog input levels: plus 10 to minus 10V DC, 12-bit digitizing, pace retrieval via remote panel or G.P.I. Price \$4,950

CANARE CABLE, INC.

832 N. Victory Blvd.
Burbank, CA 91502
(818) 840-0993

Product Name: D-403AT
Contact: Barry Brenner
Date Product Introduced: 1987

Product Description & Applications: Outstanding cable for low-loss data transmission in a point-to-point wiring system. Utilizes four conductors with a foil shield and drain wire. Each conductor has a different insulation color. An ideal choice for routing MIDI in a D.I. studio where complex installation requires a low capacitance multi-interface digital-ready cable. **Basic Specifications & Suggested List Price:** Four conductors with foil shield and overall drain wire; crosslinked polyethylene insulation; 64 ohm; 22 AWG. Suggested list price: \$0.37/ft.

CANARE CABLE, INC.

832 N. Victory Blvd.
Burbank, CA 91502
(818) 840-0993

Product Name: MR202-AT
Contact: Barry Brenner
Date Product Introduced: 1987

Product Description & Applications: Multi-channel microphone cable. Two conductor foil shield with drain per channel. Each channel (2 > 24), is individually insulated with a special PVC jacket that is color-coded for quick ID. Low capacitance and excellent frequency response. Perfect for studio runs when interfacing consoles, racks, ATRs and control room raceways.

Basic Specifications & Suggested List Price: Channels: 2 > 24, 24 AWG, aluminum tape shield, polyethylene insulation; capacitance: at 24 p/ft. Suggested list price starting at \$0.62/ft.

COLOTTI ENTERPRISES

PO Box 639
Levittown, NY 11756
(516) 221-0974

Product Name: Model #A9800 Video Separator
Contact: Ray Blumenthal of Lestec Video (516) 273-3020
Date Product Introduced: May, 1987

Product Description & Applications: Device is designed to strip the synchronization signals from a composite video signal. Four timing signals are outputted: composite sync, vertical sync, burst gate and odd/even indicator (identifies interlaced field). These outputs can be used to gen-lock video camera/VTR signals w/graphic sources, identify video field for memory storage, recover suppressed or contaminated video signals, or provide timing for data on specific scan lines. Also provided: composite video output w/gain control.

Basic Specifications & Suggested List Price: Video input: 0.5-2.0 vpp; digital outputs: TTL (can drive 75 ohm cables); power: 115 vac 50/60 Hz (optional 230 vac 50/60 Hz or 12 vdc); input/output connectors: BNC; size: 4.2" x 1.7" x 9.3". List price \$595 sold only through our distributor "Lestec Video" (516) 273-3020.

C-T AUDIO MARKETING, INC.

3050 SW 14th Pl., #3
Boynton Beach, FL 33426
(800) 282-8346

Product Name: "Stanz"
Contact: Andre Walton
Date Product Introduced: June, 1987

Product Description & Applications: This is a range of quality tripod stands available in high-grade chrome and black finishes. Fittings are of stainless steel and include all the necessary components to suspend light from a T-bar. Adaptors enable the stand to support PA speakers.

Basic Specifications & Suggested List Price: Basic chrome tripod stand \$90. Lighting crossbar kit \$44.

DEQUIR CORPORATION

4012 S. Broadway Pl.
Los Angeles, CA 90037
(213) 233-4184

Product Name: Reel to Reel Porta Rack
Contact: Tim, Steve, Bob
Date Product Introduced: July 1, 1987

Product Description & Applications: Portable equipment rack for your rack-mountable reel-to-reel tape deck. Tape deck compartment is angled at approximately 25 degrees for quick and comfortable operations. Underneath is 10 space amp rack to accommodate processing gear. Comes with full front removable lid, full removable recessed back with trap door for cables. All plywood constructions, carpet covered, metal corners, recessed handles, twist locks and optional casters.

Basic Specifications & Suggested List Price: Amplifier rack padded in and out with 1.5" "ELE" high density foam to absorb impact and prevent damage to equipment. Full 3/4" 7-plywood constructed cabinets, optional casters, front and back removable lids with recessed hardware. All cabinets are carpet covered and the perfect ATA alternative.

NEW PRODUCTS**OTHER EQUIPMENT**

1988

DENECKE INC.

5417 Cahuenga Blvd.
North Hollywood, CA 91601
(818) 766-3525

Product Name: Dcode TS Grande Time Code Concert Slate
Contact: Tom Lee, marketing manager
Date Product Introduced: June, 1987

Product Description & Applications: The TS Grande Time Code Concert Slate is big and bright! Sunshine readable! The TS Grande reads and displays SMPTE/EBU time code and drop frame status from 1/10 to 10x speed in both forward and reverse. The TS Grande has a very visible 6.5" display. The TS Grande is designed for multi-camera productions and provides time code synchronization on large scale concert shoots.

Basic Specifications & Suggested List Price: List price \$2,980. Power: 12V DC; display: 6.5" LED display, display on, full intensity 2 amps max.; input: -20 to +35 dB at 10k, 1/4" phone jack 4-pin male connector (#1 = ground, #2 = TC/user control, #3 = TC, #4 = +7 to 12 volts); weight: 8.75 lbs.; size: 25" x 17-9/16" x 1-9/16"

DENECKE INC.

5417 Cahuenga Blvd.
North Hollywood, CA 91601
(818) 766-3525

Product Name: Updated TC-1 Time Code Reader
Contact: Tom Lee, marketing manager
Date Product Introduced: June, 1987

Product Description & Applications: The multi-purpose Dcode TC-1 Time Code Reader fills an important gap by being the first inexpensive wide-range reader that also reshapes time code for copying, while generating a 60 Hz sync pulse from the time code source. The TC-1 reads up to 50x speed that allows for high speed searches and will prove to be more than useful when editing on the new digital multi-track machines. Advertising agencies will be impressed that with the TC-1, they can "spot cuts" without the need of a window dub.

Basic Specifications & Suggested List Price: List price \$625. The TC-1 displays time code in hours, minutes, seconds and frames from 1/50th to 50x speed! Recent modification makes this possible. Display: 7-segment, 3" LED; size: 1 6" x 6" x 5"; weight: 1.5 lbs.; power: 7-24 volts, AC or DC at 180 ma, 110-volt wall power supply included; input: RCA jack; output: RCA jack, 1-volt squarewave at 2k ohm, sync 60 Hz squarewave at 5 volts, 16-pin dip connector

ESL INC.

120 SW 21 Terrace, C104
Fort Lauderdale, FL 33312
(305) 791-1501

Product Name: RTW 1150 DA
Contact: Lutz Meyer

Date Product Introduced: NAB Show
Product Description & Applications: Digital peak program meter especially designed for connection to PCM-1610 or 1630 digital processors.

Basic Specifications & Suggested List Price: The device uses 2 bargraph displays and additional LED indicators for overload, headroom marker, emphasis, CRC average, hold parity and mute indications. Two display modes with greater than 60 dB range. Available in table top or panel mount versions. Suggested list price: \$2,250.

FILAM NATIONAL PLASTICS

13984 S. Orange Ave.
Paramount, CA 90723
(213) 630-2500

Product Name: Jewel Boxes for CD, Clear Boxes
Contact: Mike Bolong, VP, Brad Harse, director of mktg.
Date Product Introduced: October, 1986

Product Description & Applications: The jewel boxes for CDs are made in fully automated machines making them scratch free and consistent.

Basic Specifications & Suggested List Price: Made according to PolyGram specifications.

FIRSTCOM BROADCAST SERVICES

13747 Montfort Dr., Ste. 220
Dallas, TX 75240
(214) 934-2222

Product Name: Digifects
Contact: Cecelia M. Garr, executive vice president/general manager

Date Product Introduced: 1987
Product Description & Applications: Get a 10-day trial of the world's first and only real digital sound effects library. Only

Digifects perfectly duplicates real sound, because only Digifects is digitally recorded, mixed and mastered. No hiss, no pops or surface noise of any kind, no distortion, nothing but the super clean sound of the actual event.

Basic Specifications & Suggested List Price: 11 CDs containing over 1,000 tracks and a complete chronological and alphabetical catalog for \$650.

FLAG SYSTEMS INC.

930 N. Elm, #6
Orange, CA 92667
(714) 997-7363

Product Name: Utility Rack With Removable Caster Dolly
Contact: Dave Eastman, sales mgr.
Date Product Introduced: January, 1987

Product Description & Applications: Our 19" rack mount enclosure is available in either the shock mount Foam isolated Utility Rack (FUR model) or standard Utility Rack (UR model). Our racks as well as cases and speaker cabinets are now available with our removable caster dolly which is easily removed by releasing a single latch. This allows fast, easy stacking of any case or enclosure.

Basic Specifications & Suggested List Price: All construction is of Finland birch. Each rack has latched front and rear shipping lids. Rack rail is Cal-Chassis. All enclosures are covered with Ozite's best grade carpet. The removable caster dolly is optional on nearly any enclosure. Please call for prices per your specifications.

FLIGHT FORM CASES INC.

13102 Stone Ave. N.
Seattle, WA 98133
(206) 365-5210

Product Name: Flight Form Cases
Contact: Glenn Stenson, vice president
Date Product Introduced: Fall 1986 (new colors and options)

Product Description & Applications: Flight Form cases are reusable shipping cases that provide protection for the equipment you value. They are designed to withstand the hazards of travel and shipping. Every case is made to measure inside and out to isolate your product for maximum protection. A wide variety of custom hardware and accessories make your case as individual as the product it protects. Flight Form cases are available in red, orange, white, green, light blue, navy blue and black.

Basic Specifications & Suggested List Price: Suggested list price of a Flight Form case is based on the specifications of the customer.

FM TUBECRAFT SUPPORT SYSTEMS, INC.

1121-26 Lincoln Ave.
Holbrook, NY 11741
(516) 567-8588

Product Name: Stands
Contact: Jeff Camp
Date Product Introduced: 1987

Product Description & Applications: We are primarily a stand manufacturer. New products introduced include: ETR Series—tubular rack, QFD 30B—new double keyboard stand, XT Series—portable table for mixing consoles and personal computers.

Basic Specifications & Suggested List Price: Suggested retail: 2" thick/13.5" x 13.5" tile/\$4, 3" thick/13.5" x 13.5" tile/\$6, 2" thick/54" x 54" sheet/\$30, 3" thick/54" x 54" sheet/\$52; colors: blue, brown, red and grey; material: polyester foam.

FM TUBECRAFT SUPPORT SYSTEMS, INC.

1121-26 Lincoln Ave.
Holbrook, NY 11741
(516) 567-8588

Product Name: Acoustifoam
Contact: Jeff Camp
Date Product Introduced: 1987

Product Description & Applications: Acoustifoam, an affordable alternative for any acoustic application, provides excellent sound absorption and deflection characteristics. Applications include: studios, broadcast facilities, data processing, retail and industrial environments.

Basic Specifications & Suggested List Price: Suggested retail: 2" thick, 13.5" x 13.5" tile, \$4; 3" thick, 13.5" x 13.5" tile, \$6; 2" thick, 54" x 54" sheet, \$30; 3" thick, 54" x 54" sheet, \$52; colors: blue, brown, red and grey; material: polyester foam.

FOSTEX CORP. OF AMERICA

15431 Blackburn Ave.
Norwalk, CA 90650
(213) 921-1112

Product Name: 4011 Video Character Inserter
Contact: Marty Forrier
Date Product Introduced: October 16, 1987

Product Description & Applications: 4011 Video Character Inserter/VITC Generator and Reader can be programmed to show reader or generator time code with or without user bits. Position of code window can be adjusted as well as color. Generator/reader section has BNC connectors for the video hookup, 4011 plugs into the rear of the 4010.

Basic Specifications & Suggested List Price: Suggested retail \$1,300.

THE MOST COST EFFECTIVE SYSTEM FOR PRODUCING TRUE AUDIOPHILE CASSETTES



*at AES
see KABA at '87
872*

THIS SYSTEM:

- occupies less than 3 sq. ft. floor space
- produces 400 c-45's / shift real time
800 c-45's / shift double time
- has head life expectancy over 1 year @ 8hr./day
- has transport life expectancy of 5 years @ 8hr./day
- can do the work of a system of 88 consumer cassette decks.

No. 3 of a series —

Some reasons why KABA, the ultimate in real time and 2X
CASSETTE DUPLICATION
IS ATTRACTING SO MANY USERS (and customers to those users)

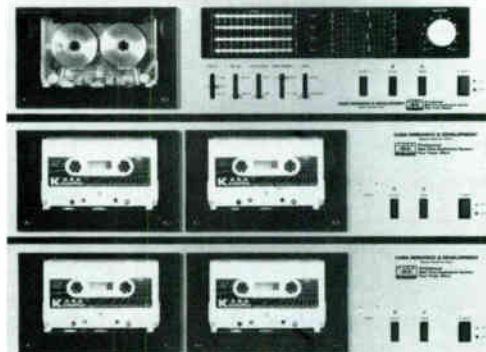


KABA Research & Development
(a division of Kenneth A. Bacon Associates)
Toll Free (800) 231-TAPE

24 Commercial Blvd., Novato, CA 94949
in CA call (415) 883-5041

THIS SYSTEM:

- costs less than \$4200
- produces up to 150 c-45's/day
- replaces up to 15 conventional consumer cassette decks



FOUR DESIGNS CO.
6531 Gross Ave.
Canoga Park, CA 91307
(818) 716-8540

Product Name: RTS-321
Contact: Dave Riddle, president
Date Product Introduced: January 23, 1987
Product Description & Applications: RTS-321 is a unique new audio adapter that provides an easy means to interconnect equipment using either 1/4" (ring, tip, sleeve) or "XLR" type connectors. RTS-321 eliminates the need for numerous adapters or special cables. Instead five miniature slide switches allow instant user selection of 32 internal wiring schemes to suit each application.
Basic Specifications & Suggested List Price: Connectors: 1/4" "tip, ring, sleeve" /3-pin cannon "XLR"; switch: 5-position (32 possible combinations); electrical: mic level to speaker level (max 10 watts), warranty one-year parts and labor; suggested list price: \$29.95

GE/RCA DISTRIBUTOR AND SPECIAL PRODUCTS
2000 Clements Bridge Rd.
Deptford, NJ 08096
(609) 853-2494

Product Name: VHS-C Chest Brace
Contact: G. Passanante, video accessories product planning
Date Product Introduced: July, 1987
Product Description & Applications: Model AC023 VHS-C Chest Brace provides steady support for a VHS-C camcorder. Basic Specifications & Suggested List Price: Attaches directly to the tripod screw mount on the bottom of the camcorder. Has spring-loaded adjustable arm and adjustable neck strap. Optional list price \$34.95

GE/RCA DISTRIBUTOR AND SPECIAL PRODUCTS
2000 Clements Bridge Rd.
Deptford, NJ 08096
(609) 853-2494

Product Name: Model TC-20 Compact VHS Videocassette
Contact: S. Dantis, mgr. videotape merchandising
Date Product Introduced: February, 1987
Product Description & Applications: Model TC-20 Compact VHS Videocassette for VHS-C camcorders.
Basic Specifications & Suggested List Price: Premium quality recording tape for superb audio and video recording and playback. Recording time is 20 minutes or one hour. Optional list price \$6.95

GRASS VALLEY GROUP
PO Box 1114
Grass Valley, CA 95945
(916) 478-3000

Product Name: Model 200 Production Switcher
Contact: Sales Dept., (916) 478-3160
Date Product Introduced: March 1987 (NAB Convention)
Product Description & Applications: Production and (especially) post-production switcher, featuring 20 inputs for two cascaded mix/effects systems. E-MEM® effects memory is built-in. Downstream keyer is standard, as are preview modes. Wipe system in each M/E is independent. Each M/E has four external fill inputs and six external key source inputs. Dual serial adapter option allows full editor control of the Model 200
Basic Specifications & Suggested List Price: Prices for the Model 200 start at \$40,000.

INSTANT REPLAY

2951 S. Bayshore Dr.
Miami, FL 33133
(305) 448-7088

Product Name: TV Standards Converter
Contact: Linda Zack
Date Product Introduced: May, 1987
Product Description & Applications: U.S.-made videotape standards converter uses new 31mm optical system with color painting for hi-resolution, flicker and judder-free PAL/SECAM to NTSC or NTSC to PAL/SECAM conversions. High quality, flexibility, user friendly.
Basic Specifications & Suggested List Price: PAL, NTSC, SECAM VHS (8mm, 3/4", beta input optional) RGB VCR plus custom made .31mm dot pitch monitor with full facilities for camera takeoff—vert/horiz centering, contrast, independent color controls. \$3.995.

INSTANT REPLAY

2951 S. Bayshore Dr.
Miami, FL 33133
(305) 448-7088
Product Name: Image Translator World Traveler VCR
Contact: Linda Zack
Date Product Introduced: June, 1987 Consumers Electronics Show
Product Description & Applications: Featuring a new RGB chip design allowing all standards of VHS tapes to be played on any TV, this multi-voltage, multi-tuner VCR also records all world TV standards making this 8k VCR the perfect traveling companion.

NEW PRODUCTS

OTHER EQUIPMENT

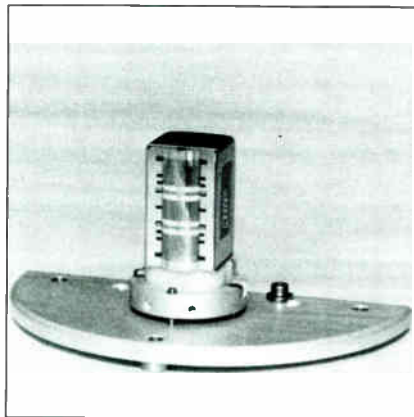
1988

Basic Specifications & Suggested List Price: VHS, PAL, SECAM, NTSC and MESECAM multi-voltage HQ VCR has RGB for quality playback in PAL, PAL color adjustment on front. Records from, plays on any kind of TV/monitor. \$1,195.

INTERNATIONAL ELECTRO-MAGNETICS

350 N. Eric Dr.
Palatine, IL 60067
(312) 358-4622
Product Name: IEM
Contact: Tony Pretto

Date Product Introduced: May, 1987
Product Description & Applications: A combination audio, erase and time code reader head for analog recorders.
Basic Specifications & Suggested List Price: The 989 series of IEM Time Code heads start at \$150. Standard mounting and interface with most professional recorders.



JRF MAGNETIC SCIENCES
PLX 1/4" replacement heads

JRF MAGNETIC SCIENCES

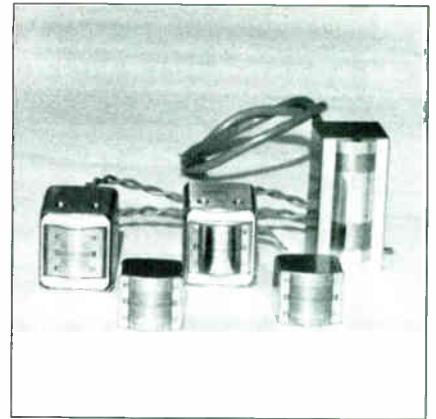
PO Box 121, Kennedy Rd.
Greendell, NJ 07839
(201) 579-5773
Product Name: PLX (Extended Life) replacement heads for 1/4" reel to reel

Contact: John R. French, president
Date Product Introduced: June 1, 1987
Product Description & Applications: JRF/Magnetic Sciences introduces a new (PLX series) line of direct replacement magnetic heads for mastering, recording studio and broadcast equipment. The new, highly efficient and long wear/abrasive-resistant material extends the service life five times that of conventional permalloy materials. Long term stable peak performance, exact compatibility and consistency are some of the features. Replacement heads are available for Sony/MCI JH-110A/B/C, Scully 280 and 280B, Ampex 440A/B/C, Otari MX 5050B, MTR-10/12/20 1/4" mono and 2-track tape machines. Other formats available on request.

Basic Specifications & Suggested List Price: Mechanical construction tolerances (track width, track center/center, base to track, gap/crown centering) within .001. Electrical performance consistency (track to track output level, low/high frequency response, etc.) within 1 dB. Extended life (5x permalloy). Exclusive 2-year warranty. Suggested list (1/4" 21k) \$225-\$275.

JRF MAGNETIC SCIENCES

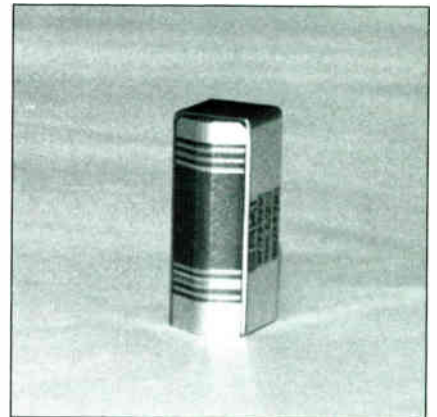
PO Box 121, Kennedy Rd.
Greendell, NJ 07839
(201) 579-5773
Product Name: PLX (Extended Life) replacement heads for 16 & 35mm magnetic film
Contact: John R. French, president
Date Product Introduced: June 1, 1987
Product Description & Applications: JRF/Magnetic Sciences introduces a new line of direct replacement heads for 16mm and 35mm magnetic film equipment. The new extended long life heads (PLX series) are available in one to six stripe formats for Magna-Tech, MTM/Rangertone, Westrex, Steenbeck and Magna-Sync recorders, editors and dubbers. Features include extremely hard abrasive resistant material insuring long



JRF MAGNETIC SCIENCES
PLX 16 & 35 mm replacement heads

term stable peak performance and exact mechanical/electrical compatibility. Head refurbishing, installation of new PLX series, heads and optical set up and alignment of complete assemblies are available.

Basic Specifications & Suggested List Price: Mechanical construction tolerances (track width, track center/center, base to track, gap/crown centering) within .001. Electrical performance consistency (track to track output level, low/high frequency response etc.) within 1 dB. Extended life (5X permalloy). Exclusive 2-year warranty. Suggested list (1 stripe 35mm/16mm) \$250



JRF MAGNETIC SCIENCES
Audio Post Replacement Heads

JRF MAGNETIC SCIENCES

PO Box 121, Kennedy Rd.
Greendell, NJ 07839
(201) 579-5773
Product Name: Audio Post Replacement Heads for Sony (1" C format)

Contact: John R. French, president
Date Product Introduced: September 1, 1987
Product Description & Applications: JRF/Magnetic Sciences introduces a new direct replacement, Audio Post R/P head for the Sony (1" C format) Models BVH-1000, BVH-1100, BVH-2000, BVH-2500P and other equipment. The all-glass bonded ferrite construction insures a continuous service life ten times that of standard permalloy heads. Costly, frequent and time consuming head changes are reduced substantially. The entire tape contact area (including record/playback tracks, wear center bar and guard band area), is manufactured with extremely long (and even) wearing ferrite and ceramic materials.
Basic Specifications & Suggested List Price: Extended life 10X permalloy Direct replacement compatibility

KIMBER KABLE
2675 Industrial Dr.
Ogden, UT 84401
(801) 621-5530

Product Name: Kimber Kable
Contact: Ray Kimber, Jeff Young
Date Product Introduced: May, 1987
Product Description & Applications: Designed to be the ultimate microphone cable, Kimber Kable Model KC1 incorporates new design and materials. The internal design is three conductors with a conductive fabric shield, the three conductors are braided, not twisted, they cross at near right angles

but do not spiral. The alloy conductors have a 10:1 ratio strand size makeup. This cable will make a dramatic sound improvement and should be carefully considered for all audio applications, including studio wiring.
Basic Specifications & Suggested List Price: Kimber Cable KC1 3 cond/w shield \$5 per foot

KING INSTRUMENT CORPORATION

80 Turnpike Rd.
 Westboro, MA 01581
 (617) 366-9141

Product Name: Model 2500 King Dual Supply VHS Video Cassette Loader
Contact: J.C. Ciccone
Date Product Introduced: August, 1986
Product Description & Applications: Fully automatic in-cassette loading of VHS-type video cassettes. The Model 2500 features state-of-the-art computer control of all operations and test functions. Constant tape tension is achieved by the servo-drive system. Tape guidance is controlled by air bearings. The dual supply tape system insures automatic reel changing without operator assistance. The operation is completely automatic, from feeding empty cassettes to splicing and winding. A single line display indicates operation and test information.

Basic Specifications & Suggested List Price: Supply voltage: 100-240 VAC Selectable, vacuum: self-contained or external; winding speed up to 650 ips, T-120 in 33 seconds; wind tension 1.75 to 10.75 oz., weight 422 lbs., max. pancake 16"; price \$26,500 FOB factory.

KING INSTRUMENT CORPORATION

80 Turnpike Rd.
 Westboro, MA 01581
 (617) 366-9141

Product Name: Model 2797 Audio Cassette Loader
Contact: J.C. Ciccone
Date Product Introduced: AES Show New York, October, 1987
Product Description & Applications: Fully automatic in-cassette audio loader to be introduced at AES. This loader will feature the latest innovations in cassette loader technology. Higher productivity than any loader in the market today.
Basic Specifications & Suggested List Price: To be announced.

L & L SALES CO. INC.

PO Box 238
 Madison, IN 37116
 (615) 868-6976

Product Name: George L's Cable Warehouse
Contact: Kimberly Lewis, mgr.
Product Description & Applications: We have two solderless coax systems in sizes 155 and 225 dia. wire and plugs. Our plugs range from quarter inch, right angle, audio pin and mini. The Speaker Cable Warehouse is also solderless with a quarter-inch plug to fit.

LATIN PERCUSSION/DIV. OF LP MUSIC GROUP

160 Belmont Ave.
 Garfield, NJ 07026
 (201) 478-6903

Product Name: The Claw
Contact: George Rose, sales mgr.
Date Product Introduced: Improved version 1987
Product Description & Applications: The Claw will mount to any drum rim via an adjustable clamp and hold all standard microphones. The adjustable support rod will accept mic holders with 5/8-27 thread and is shock mounted for maximum isolation.
Basic Specifications & Suggested List Price: LP592A Microphone Claw retail \$29.50 LP592B Percussion Claw retail \$21 LP592S Splash Cymbal Claw retail \$26

LEITCH VIDEO OF AMERICA INC.

825K Greenbrier Circle
 Chesapeake, VA 23320
 (804) 424-7920

Product Name: AVS-481 Audio-Video Switcher
Contact: Gary Stephens, technical support & sales
Date Product Introduced: April, 1987
Product Description & Applications: Audio switcher or video switcher or both (audio follow video), 8-input, 1-output, audio break-away

L.M. ENGINEERING

660 W. Evergreen Ave.
 Youngstown, OH 44511
 (216) 788-7373
 (800) 874-8326 (USA)
 (800) 551-1960 (Ohio)

Product Name: XL Series Cases
Contact: Joe Maluso, president
Date Product Introduced: 1987
Product Description & Applications: XL Series cases feature a one-piece continuous aluminum extrusion forming the sides of the case. They have surface mounted, black epoxy coated

hardware and offer lightweight protection at affordable prices. New XL styles include microphone cases, XLC combo key-board cases, XL Series racks, XL briefcases
Basic Specifications & Suggested List Price: Call for prices and specific product information.

THE MUSIC PEOPLE, INC.

PO Box 648
 West Hartford, CT 06107
 (203) 521-2248

Product Name: MS-9311 Drum/Amp Mic Stand
Contact: Jim Hennessey, president
Date Product Introduced: June, 1987
Product Description & Applications: An addition to the on-stage stands line, the MS-9311 is a low height mic stand with a boom and with a small base diameter. Its size makes it ideal for low, harder to reach areas that require miking, such as kick drums and amplifiers.

Basic Specifications & Suggested List Price: The MS-9311 is constructed of heavy-duty chrome tubing with a diecast triangular base. It stands 18" in the fully closed position and 28" when fully extended. The boom is fixed at 24". Suggested list \$39.95

THE MUSIC PEOPLE, INC.

PO Box 648
 West Hartford, CT 06107
 (203) 521-2248

Product Name: Quick Klip
Contact: Jim Hennessey, president
Date Product Introduced: June, 1987
Product Description & Applications: This patent-pending unique and universal quick release mic device, which allows you to attach or detach a mic lip or boom arm to a mic stand with the push of a button, eliminates both broken mic clips and the lengthy process of unscrewing boom arms. An additional, more comfortable plus is being able to hold your microphone in your hand on a vertical, rather than horizontal angle once you've disengaged it from the mic stand.

Basic Specifications & Suggested List Price: The Quick Klip comes in two pieces—a high impact, thermal plastic socket with a threaded brass insert (5/8" x 27 thread) and a spring-loaded quick release button and a steel geared stud which meshes easily with the socket. This geared stud is multi-notched, so the mic clip can be inserted on the mic stand in any direction required. Suggested list: \$7.95

NASSA DESIGN ASSOCIATES

Box 367
 Bearsville, NY 12409
 (914) 679-9544

Product Name: Synclavier Computer Workstation/Keyboard Table
Contact: Kenneth W. Lonas, designer
Date Product Introduced: November, 1986
Product Description & Applications: Sturdy, attractive and efficient workstations for the Synclavier digital audio system. Places all components in a convenient enclosure. Custom designs available.

Basic Specifications & Suggested List Price: Workstation houses: computer keyboard, monitor, one or two disk drives, includes disk storage drawer, disk storage shelf, pull-out mouse pad or writing surface, surge suppression and line filters on all three legs with on/off switch and power failure reset switch. Call for pricing.

NASSA DESIGN ASSOCIATES

Box 367
 Bearsville, NY 12409
 (914) 679-9544

Product Name: Custom Production Consoles
Contact: Kenneth W. Lonas, designer
Date Product Introduced: November, 1986
Product Description & Applications: Custom designs for smaller mixing consoles and video switchers. Units can house rack mount equipment and computer workstations all in one compact console. Put all your equipment together in one efficient workspace.

Basic Specifications & Suggested List Price: All units constructed of hardwood frame, hardwood plywood and hardwood trim. Surfaces of plastic laminate or acrylic lacquer finish. Custom hardware used throughout. Call for pricing.

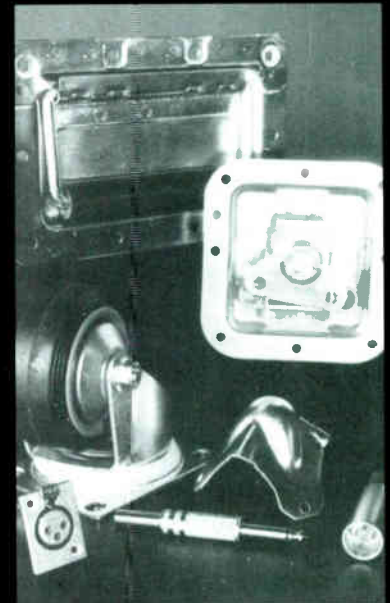
OMNIMOUNT SYSTEMS

10850 Vanowen St.
 North Hollywood, CA 91605
 (818) 766-9000

Product Name: Omnimount Systems
Contact: Jim Schaller, sales manager
Date Product Introduced: March, 1987
Product Description & Applications: New 75 Series Mounting Assemblies for hanging speakers, monitors or other products weighing between 15 and 40 lbs. Also available: New Vibration Isolators. These products join our extensive product line of

CASE AND CABINET HARDWARE

OVER 300 DIFFERENT PRODUCTS IN STOCK



3 DEPOTS

NEW JERSEY:
 29 B. Ethel Avenue
 Hawthorne, New Jersey 07506
 Telephone: (201) 423-4404

DETROIT:
 2144 Woodbridge Avenue
 Detroit, Michigan 48207
 Telephone: (313) 961-9111

LOS ANGELES:
 1111 Rancho Conejo Blvd.,
 Unit 303
 Newbury Park, California 91320
 Telephone: (805) 499-5932

PENN FABRICATION (USA) INC.

Circle #226 on Reader Service Card

—CONTINUED ON NEXT PAGE

mounting assemblies for hanging or supporting products weighing from ounces to hundreds of pounds. All new, complete reference guide now available for quick and easy specifying of mounting hardware
Basic Specifications & Suggested List Price: Call or write for Quick Reference Guide, including detailed specifications of complete line of mounting hardware and accessories

ONYX ADVANCED AUDIO TECHNOLOGIES

Graanhoeve 52
 3992 NK Houten, The Netherlands
 (0) 3403-73818
Product Name: Onyx CDP Pro 1
Contact: J.P. van Vliet
Date Product Introduced: June, 1987
Product Description & Applications: Onyx Advanced Audio Technologies designed a low budget professional CD player, the Onyx CDP Pro 1. In fact the Onyx CDP Pro 1 is a domestic Denon CD player which is modified by Onyx for use in a professional audio environment. The modification as developed, manufactured and built-in by Onyx consists of two solid state balanced outputs and a fader start/stop input. Applications: broadcast and recording studio systems, TV/radio networks, discotheques, PA sound systems, A/V post-production
Basic Specifications & Suggested List Price: Basic specifications in conformity with Denon DCD 300. Balanced outputs: XLR03, output impedance 60 ohms, output level switchable -10 dB/+4 dB; unbalanced outputs: phono connectors, output impedance 10k ohms, output level fixed +8 dB; fader start/stop input DIN 5 pin female for inter-connection with fader micro-switch

OPTICAL DISC CORPORATION

17517-H Fabrica Way
 Cerritos, CA 90701
 (714) 522-2370
Product Name: ODC 530 CD Mastering System
Contact: Donald R. Hayes, vice president marketing
Date Product Introduced: September, 1986
Product Description & Applications: The ODC Model 530 Compact Disc Mastering System provides the compact disc manufacturing industry with a method of producing a high quality recorded glass master from which replication is easily performed. ODC has simplified the CD mastering technology with their Non-Photo Resist (NPR) Mastering Process which has fewer and less complicated steps than other processes available

OPTICAL ELECTRONICS, INC.

2700 E. Bilby Rd.
 Tucson, AZ 85706
 (602) 889-8811
Product Name: Video Enhancement Products
Contact: Suzanne E. Gerdes, president
Date Product Introduced: January, 1987
Product Description & Applications: 1) RGB to NTSC conversion module. 2) Timing generator
Basic Specifications & Suggested List Price: Operates at video rates in real time

ORION RESEARCH

1315 Main, #230
 Durango, CO 81301
 (303) 247-8855
Product Name: Orion Blue Books for: musical instruments/audio/video/computers
Contact: Roger Rohrs, president
Date Product Introduced: January, 1987
Product Description & Applications: 1987 blue books with used prices for musical instruments, pro sound, audio, video, cameras and computers. Full book of charts about the industries. Software: inventory package—preferred customer, mailing list
Basic Specifications & Suggested List Price: Audio blue book \$125, other books \$99.50 each, graphic book with research charts \$250. Software: inventory \$79.50, preferred customer \$69.50, mailing list \$29.95.

OVAL WINDOW AUDIO

4 Collins Rd.
 Yarmouth, ME 04096
 (207) 846-6250
Product Name: Miniloop II/Superloop II
Contact: Norman Lederman, director
Date Product Introduced: January, 1987
Product Description & Applications: Audio magnetic induction room system for providing cues to talent on stage or on (television) sets as well as for use with hearing impaired individuals (hearing aid wearers entering a "looped" room/ space will receive a direct transmission from the podium, stage, wireless mic, etc.)
Basic Specifications & Suggested List Price: Miniloop II (\$595) covers an area up to 50' x 50', Superloop II (\$795), up to 125' x 125'. Both systems are prewired and ready to use,

NEW PRODUCTS

OTHER EQUIPMENT

1988

complete with wireless microphone and additional inputs for existing public address system feeds. Accessory items include receivers, loop wire mountings and mics.

PENNY & GILES

2716 Ocean Park Blvd., Ste. 1005
 Santa Monica, CA 90405
 (213) 393-0014
Product Name: RF11 Rotary Fader
Contact: Gaynor Moses, manager
Date Product Introduced: April, 1987
Product Description & Applications: The RF11 Rotary Fader has been developed for use as a channel fader in news gathering consoles and as a high quality, long life monitor level potentiometer.
Basic Specifications & Suggested List Price: Features: long life rugged construction, accurate stereo tracking, maintenance-free sealed construction.

PHILIPS

1111 Northshore Dr.
 Bldg. 2, Ste. 726
 Knoxville, TN 37919
 (615) 558-5267
Product Name: Master Recording System Series 3600
Contact: David M. Pushic, director of marketing
Date Product Introduced: January 1, 1987
Product Description & Applications: Modular, expandable Master Recording System for generating glass masters for compact disc replication. System is expandable to CD-ROM, CD-V, CD-I, Laser Vision and other formats. Features an integrated clean air flow chamber to minimize clean room requirements and automated disc loading to lessen operator handling problems

ROH

913 W. 223rd St.
 Torrance, CA 90502
 (213) 533-5984
Product Name: Model 302 Master Party Line Station
Contact: Dan Garrigan, director of marketing
Date Product Introduced: July, 1987
Product Description & Applications: The Model 302 combines the features of ROH Master Stations and industry-standard two-wire Party Line Systems. A single master channel (switchable 2-wire or 4-wire) can provide squawk/tally functions in a large intercom system or add features such as IFB, PAGE or TELCO to a Party Line system. The 302's two PL channels are plug compatible with ROH, Clearcom or RTS systems
Basic Specifications & Suggested List Price: 302 Master Party Line Stations include individual mic switches and volume controls, PL channel selector, sidetone and mute adjustments. Dynamic and electret headset connectors. Built-in speaker. Size: 1.75" H x 19" W x 7.25" D, pro net price: \$920



RPG DIFFUSOR SYSTEMS, INC.

RPG DIFFUSOR SYSTEMS, INC.
 Largo, MD

RPG DIFFUSOR SYSTEMS, INC.
 12003 Wimbledon St.
 Largo, MD 20772

(301) 249-5647

Product Name: Trifusor
Contact: Peter D'Antonio
Date Product Introduced: March, 1987
Product Description & Applications: RPG Diffusor Systems has developed a variable acoustics module called the Trifusor™ as part of its complete acoustical treatment system. The Trifusor is a rotatable triangular prism with absorptive, reflective and diffusive sides and had its origins as a Greek theatrical device called a *periaktoi* used to change scenes. Applications include recording/broadcast studios, orchestra pits, performance stages, rehearsal rooms, Foley stages and sampling rooms, audiophile showrooms, psychoacoustics labs, media evaluation rooms and home listening rooms.
Basic Specifications & Suggested List Price: The standard Trifusor is an equilateral triangular prism 47% high with three 23% sides. The Trifusor weighs 40 lbs. Standard finish is lacquered natural birch for the reflective side and the QRD-734 diffusor side and Guilford Silver Neutral fabric for the absorptive side. Custom Designer Trifusors are also available.

RPG DIFFUSOR SYSTEMS, INC.

12003 Wimbledon St.
 Largo, MD 20772
 (301) 249-5647
Product Name: Abfusor
Contact: Peter D'Antonio
Date Product Introduced: March, 1987
Product Description & Applications: RPG Diffusor Systems has developed a new class of sound absorbing surface called an absorption phase grating, APG™, to complement its line of sound diffusing reflection phase gratings. This new broad bandwidth sound absorber, called an Abfusor, combines the properties of porous absorption and diffusion for the high and mid-frequencies and diaphragmatic absorption for the low-frequencies. Applications include recording/broadcast studios, conference rooms, offices, classrooms, entertainment venues and arenas, audiophile showrooms and home listening rooms.
Basic Specifications & Suggested List Price: The Abfusor is available in 2' x 2' (\$135) and 2' x 4' (\$225) panels, with an average thickness of 2", for mounting on a wall or in a standard suspended ceiling grid. The Abfusor is fire-safe and covered with a Guilford Panel fabric NRC=1.0 with an absorption coefficient of 0.82 at 125Hz

SEEBURG PHONOGRAPH CORPORATION

105 Westwood Ave.
 Addison, IL 60101
 (312) 543-1270
Product Name: SCD-1 LaserMusic System
Contact: Joe Pankus, executive VP
Date Product Introduced: October, 1986
Product Description & Applications: Compact disc playing jukebox which holds 60 compact discs, can be adapted to home use, promotional give-away, in-store listening device or used in restaurant or bar-type establishment
Basic Specifications & Suggested List Price: List price \$4,695.

SEIKO/C. BRUNO & SON, INC.

20 Old Windsor Rd.
 Bloomfield, CT 06002
 (203) 243-8353
 (800) 323-7784
Product Name: Seiko Sound Producer
Contact: Alex Fraser, marketing mgr
Date Product Introduced: January, 1987
Product Description & Applications: The Sound Producer is a multi-function LCD stopwatch designed as a production aid. The four modes of operation are: calculator for adding segment times in hours, minutes and seconds count down timer; stopwatch, and time-of-day clock. The Sound Producer can be used both in the studio or in the field.
Basic Specifications & Suggested List Price: Oscillation of quartz: 32,768Hz, timer accuracy within +0.001% at 5 degrees to 35 degrees C (41 degrees F to 95 degrees F); operating temperature range: -10 degrees to +60 degrees C (14 degrees F to 109 degrees F). Suggested list price \$49.95.

SHAPE INC.

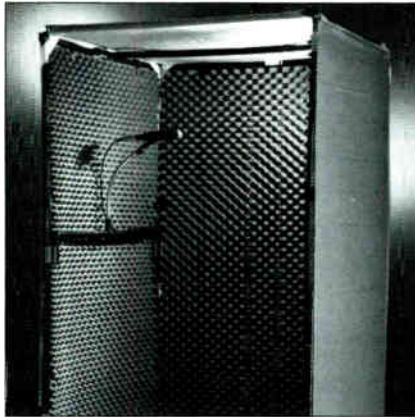
PO Box 366
 Biddeford, ME 04005
 (207) 282-6155
Product Name: SHAPE CD-Retailer
Contact: Jean Bettes, sales coordinator
Date Product Introduced: June, 1987
Product Description & Applications: The SHAPE CD-Retailer provides a low-cost, tamper resistant solution to the 6" x 12" format (tuck box). Unlike its blistering counterpart, the SHAPE CD-Retailer allows for easy removal of the compact disc after removing the shrink wrap and following the directions molded into the plastic frame. It also offers exceptional durability and protection to the CD due to its rugged design

SHAPE INC.
 PO Box 366
 Biddeford, ME 04005
 (207) 282-6155
 Product Name: SHAPE CD-FlipFile
 Contact: Jean Bettes, sales coordinator
 Date Product Introduced: June, 1987
 Product Description & Applications: The SHAPE CD-FlipFile is consistent with the 6" x 12" format, yet also serves as a storage unit that holds up to 20 compact discs. Within the retail merchandising sector, the CD-FlipFile can be utilized as a means for marketing a compact disc. Record labels can benefit by using the SHAPE CD-FlipFile as a retailing tool for special promotional release CDs and national distribution companies can use it for storing compact discs

SHAPE INC.
 PO Box 366
 Biddeford, ME 04005
 (207) 282-6155
 Product Name: SHAPE CD-LiftLock™
 Contact: Jean Bettes, sales coordinator
 Date Product Introduced: June, 1987
 Product Description & Applications: In contrast to conventional jewel boxes, the SHAPE CD-LiftLock™ has a positive latch for opening ease. Upon opening the CD-LiftLock, the enclosed compact disc is automatically elevated by a lifter and unlocked, thus being easily removed with one hand. The SHAPE CD-LiftLock provides a more user-friendly alternative to conventional jewel boxes, with the ability of accommodating the booklet and insert.
Basic Specifications & Suggested List Price: Conforms to international jewel box standards, and is compatible with standard inserts, jackets and CD booklets. For pricing information, please contact the above for more information.

SHINTRON COMPANY, INC.
 144 Rogers St.
 Cambridge, MA 02142
 (617) 491-8700
 Product Name: CB100-EN Candybox Encoder
 Contact: Fran Curran, sales
 Date Product Introduced: June, 1987
 Product Description & Applications: One of ShINTRON's new Candybox Series compact accessories, the CB100-EN Encoder encodes from RGB to NTSC. It is a monitor-grade NTSC encoder for small to medium production systems and computer graphics environments. Requires only house color black

for sync. Can generate PAL signal Adjustable subcarrier phase for system timing.
Basic Specifications & Suggested List Price: Inputs: RGB, color black (for PAL, PAL pulse and PAL-RFP), BNC, outputs: two unbalanced, co-axial, BNC; gain controls: luminance, chromance, sync level; subcarrier phase: coarse and fine adjustment, dimensions: 5.25"W x 1.7"H x 10"D, weight: 5 lbs. Suggested list \$1,000.



SOUNDFORMS
 Sound Control System

SOUNDFORMS
 PO Box 1588
 Lemon Grove, CA 92045
 (619) 753-4634
 (800) 822-0354
 Product Name: Soundforms Sound Control System
 Contact: Lee Benelli, marketing
 Date Product Introduced: January, 1987
 Product Description & Applications: Lightweight, portable acoustic panels that set up in less than 90 seconds. Each panel consists of an ABS plastic frame (42" x 72"), 2" thick acoustic foam, wall mounts, color cover and travel bag. Modular design allows assembly of panels into free-standing sound

booths, sound rooms, or sound walls of any size or shape. Excellent for on-location or in-studio. Designed for vocal booths, sound isolation (gobos) or acoustic treatment for the music, film and broadcast industries.

STANTON MAGNETICS INC.
 200 Terminal Dr.
 Plainview, NY 11803
 (516) 349-0235
 Product Name: Stanton
 Contact: Jean Kapen, mgr. adv. & promotion
 Date Product Introduced: June, 1987
 Product Description & Applications: Stanton's new SRS audiophile/professional headphone series has a deluxe dynamic driver designed to maximize the performance of any analog or digital stereo system while its unique patented independent suspended ear cup design provides true wearer comfort. These headphones have been designed to provide incredible flat frequency response, superb imaging, complete isolation. The SRS series is available in four models.
Basic Specifications & Suggested List Price: Frequency response: SRS-215 = 20-20kHz/SRS-225/SRS-245 = 10-22kHz, SRS-265 = 5-22kHz; sensitivity SPL (sound pressure level) at 1kHz ea. channel: SRS-215 = 98 dB, SRS-225/SRS-245 = 94 dB, SRS-265 = 96 dB, max power input each channel: all four models = 0.1 watt; distortion at 1kHz at rated SPL, all four models are less than 0.5%, impedance at 1kHz each channel: SRS-215 = 50 ohm, SRS-225/SRS-245/SRS-265 = 100 ohm; acoustic type: SRS-215/SRS-225/SRS-245 = semi-open, SRS-265 = closed. All models have a 2-year warranty.

STAR CASE
 648 Superior
 Munster, IN 46321
 (219) 922-4440
 Product Name: Super Star Line of Cases
 Contact: Bernie Fryman, VP marketing
 Date Product Introduced: August, 1987
 Product Description & Applications: Super Star Cases are a premium ATA flightcase which features anodized angle extrusions with the deepest tongue & groove valance available for positive closure. It has heavy gauge step-down ball corners and valance clamps, extra-wide piano hinge and has special double support construction.
Basic Specifications & Suggested List Price: Any case is available in Super Star for about 20% more than standard ATA prices.

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COMPANY _____

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STEVEN ELECTRONICS
Steven Volt-Tamer™ PVT-3600

NEW PRODUCTS

OTHER
EQUIPMENT

1988

STEVEN ELECTRONICS/DIV. OF LP MUSIC GROUP
160 Belmont Ave.
Garfield, NJ 07026
(201) 478-6903

Product Name: Steven Volt-Tamer™ PVT-3600
Contact: George Rose, sales manager
Date Product Introduced: TBA

Product Description & Applications: The PVT-3600 is a single space 19" rack-mountable voltage line conditioner and surge suppressor. Designed to protect sensitive audio gear from damage due to voltage spikes and surges, the Volt-Tamer™ also filters out unwanted noise from fluorescent lights, electric motors, etc. The PVT-3600 is equipped with two sets of four A/C outlets each with its own circuit breaker. Dual auto-

matically switched pull-out lights and an LED line voltage meter round out this full featured unit.

STUDER REVOX AMERICA, INC.

1425 Elm Hill Pike
Nashville, TN 37210
(615) 254-5651

Product Name: Studer A727 Professional CD Player
Contact: David Bowman, director of professional dealer products

Date Product Introduced: April, 1987

Product Description & Applications: The A727 is designed for a broad range of broadcast on-air and production applications. Features include balanced line outputs, modular circuit boards, die-cast transport chassis and self-luminescent display. Operating software provides cue-to-music, start review and end review. Audio performance has been enhanced by new LSI converters, 4x oversampling and digital filtering. Fader start and both parallel and serial remote control can be accommodated.

Basic Specifications & Suggested List Price: Freq. resp. 20Hz-20kHz +/-0.1 dB, SN ratio > 100 dB, channel separation > 90 dB, start from pause < 0.6 sec. Professional user net price: \$2,350.

SUSPENDERS/DIV. OF LP MUSIC GROUP

160 Belmont Ave.
Garfield, NJ 07026
(201) 478-6903

Product Name: Suspenders Speaker Stand S721

Contact: George Rose, sales mgr.

Date Product Introduced: Black Version 1987

Product Description & Applications: Constructed of 1.5" extruded aluminum with reinforced plastic joints and memory clamps. This stand will provide solid and stable support for speakers weighing up to 250 lbs. Available in silver and black.

Basic Specifications & Suggested List Price: Height is 4'7" max leg spread is 3'6". Comes with speaker mount. S721 suggested retail \$154.95.

SUSPENDERS/DIV. OF LP MUSIC GROUP

160 Belmont Ave.
Garfield, NJ 07026
(201) 478-6903

Product Name: Suspenders Mixer Stand S522

Contact: George Rose, sales mgr.

Date Product Introduced: Upgraded 1987

Product Description & Applications: This stand is packed with features that make it very unique. Of sturdy steel construction, it offers maximum stability yet is not heavy. The legs are independently height adjustable and feature adjustable feet for additional leveling. Sliding length adjustment will allow this stand to accommodate virtually all mixers, speakers, or keyboards. Legs fold flat for portability.

Basic Specifications & Suggested List Price: Length is 28-43" Depth is 12.5". Height is 27-34.5". S522 suggested retail \$95.95

SWITCHCRAFT, INC.

5555 N. Elston Ave.
Chicago, IL 60630
(312) 792-2700

Product Name: High Power Speaker Plug & Jack

Contact: Bill Kysiak, audio products manager

Date Product Introduced: May 15, 1987

Product Description & Applications: New Switchcraft speaker jack and plug are designed for high power (15 A continuous) speaker connections. First .25" dia. plug to accept up to 10 AWG wire without soldered connection. 15 A continuous with 30-degree C heat rise. Collet strain relief provides positive cable retention. 10,000 insertion/withdrawal cycles (min.). Positive detent retains plug. RED jack housing and RED tip insulator indicates high power rating. Screwdriver or solder terminations. Plug accommodates cables up to .344" (8.7mm) dia. with cable clamp.

Basic Specifications & Suggested List Price: Plug, Tip, sleeve and handle are nickel plated brass; tip and sleeve terminals are electro-tin plated brass; insulators and cable clamp are thermoplastic; screws are cadmium plated steel. Jack: Housing is glass-reinforced thermoplastic, UL 94V0; tip spring and ground terminals are nickel silver; bushing and hardware are nickel-plated brass.

TAPEX CORPORATION

PO Box 24116, 2999 NE 12 Terr.
Fort Lauderdale, FL
(305) 565-1617

Product Name: T-8 Plate Maker

Contact: Bob Coningsby, VP

Date Product Introduced: October, 1986

Product Description & Applications: The T-8 is a water washout plate-making machine designed for making printing plates in-house for use on Apex printers as well as label printing machines.

Basic Specifications & Suggested List Price: The T-8 is capable of making a set of plates that is 8" x 12" in less than ten

BACK ISSUES

- 1986 January, Northwest Studios. Equipping Home Studios. Paul Winter. SMPTE-MIDI Connection. Yoko Ono.
- 1986 February, Independent Engineers & Producers. Microphone Special Report. Laurie Spiegel. Budgeting for Sessions. Joni Mitchell.
1986 March — SOLD OUT
- 1986 April, Video Production & Post Production Facilities. Video Supplement. Al Kooper. Wireless Mics. Alan Parsons.
- 1986 May, Northeast Studios. Digital Supplement. Sampling Primer. CD Facilities. Future of Console Design. Steve Lillywhite.
- 1986 June, Remote Recording & Sound Reinforcement Listings. Roadability. Russ Titelman. CD-ROM & CD-I. Ry Cooder.
1986 July — SOLD OUT
- 1986 August — SOLD OUT
- 1986 September, Southern California Studios. Film Sound. Telecommunications. Production Music Libraries. David Byrne's True Stories.
1986 October — SOLD OUT
- 1986 November, New Products Directory. CD-I Supplement. Kenny Loggins Tour Sound. Daryl Hall. Grounding Primer. Rupert Neve.
- 1986 December, Tape-to-Disc Issue: Mastering, Pressing & Duplication Facilities. CD Manufacturing. Mastering

Engineers' Forum. Lee Ritenour's Studio. Casey Kasem.

1987 January — SOLD OUT

- 1987 February, Independent Engineers & Producers. International Recording Supplement. APRS Studio Directory. Bruce Lundvall. DMM for CD. Kitaro.
- 1987 March, Southeast Studios. Digital Recording Supplement. Tom Jung. CD Mastering Forum. Richard Thompson.
- 1987 April, Video Production & Post-Production Facilities. Location Mic Techniques. Adrian Belew. Synchronizer Survey. Pee-wee's Playhouse.
- 1987 May, Northeast Studios. Stevie Wonder & Nile Rodgers Record by Satellite. Programmable Signal Processors. GRP Records. Digital Video Interactive. George Martin.
- 1987 June, Remote Recording & Sound Reinforcement Listings. Touring Consoles. Video's Stephen Johnson. Women in Sound Reinforcement. Paul Simon Live in Zimbabwe.
- 1987 July, Recording Schools Directory and Southwest Studios. MIDI Software Tutorial. Jim Gaines. Narada Michael Walden's Tarpan Studio. Microphones. Jerry Garcia.
- 1987 August, Studio Designers & Suppliers. Tenth Anniversary Issue. Bob Ludwig. Future of A/V Recording. Wendy Carlos. Sound for *Platoon*. Santana.
- 1987 September, Southern California Studios. Recording in Hawaii. The Doors. Analog 2-tracks. Phil Spector.

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T.M.B./MOGAMI

3416 W. Burbank Blvd.
Burbank, CA 91505
(818) 842-9652

Product Name: Definition Series Speaker Cables

Contact: Colin R. Waters

Date Product Introduced: June 1, 1987

Product Description & Applications: Custom-designed cables for professional sound reinforcement speaker systems using active crossovers or multiple amplifier channels. Available in 4-, 6- and 8-conductor versions. The cables are designed to give outstanding audio performance combined with toughness and flexibility even in the worst conditions. The only cables designed for this purpose.

Basic Specifications & Suggested List Price: Conductor size 2.5 sqmm (approx. 13 ga.). 224 strands pure oxygen-free copper per conductor. Special PVC jacket and conductor insulation. Outside diameter (4) 11.3mm, (6) 12.8mm, (8) 14.2mm.

TOUCH TECHNOLOGIES INC.

363 Adelaide St. E.
Toronto, Ontario, M5A 1N3 Canada
(416) 865-1877

Product Name: M/LMS

Contact: Alan Hardiman, director communications

Date Product Introduced: May, 1987

Product Description & Applications: A microprocessor-controlled modular system, M/LMS can handle hundreds of microphones, each with an associated monitor speaker, selectively muting each speaker through several levels from full on to full off, thus preventing feedback into any open mic from any speaker any distance away. Each module contains all circuitry for each mic/speaker pair including mic preamp, limiter, power amp, logic controlled audio switches and tally lamp driver circuitry. Complete redundancy of all power supplies, processors and buses is provided to assure reliability.

ULTIMATE SUPPORT SYSTEMS, INC.

PO Box 470
Fort Collins, CO 80522
(303) 493-4488

Product Name: MC-66B

Contact: Tom Kellenberger

Date Product Introduced: January, 1987

Product Description & Applications: The Ultimate Microphone Stand has a unique clutch design allowing for height adjustment with one hand. The tripod base is strong, yet collapses with a quarter turn at the bottom of the stand. The combination of innovative design, hi-tech plastics and rigid aluminum alloys make this stand tough and long lasting, yet it weighs only three pounds. It has a cord clip built into it and an optional tote bag is available for transportation ease.

Basic Specifications & Suggested List Price: The Ultimate Microphone Stand is available in either a silver or black anodized finish. Colors that are released include red, blue and violet. MC-66B suggested retail: \$80.

ULTIMATE SUPPORT SYSTEMS, INC.

PO Box 470
Fort Collins, CO 80522
(303) 493-4488

Product Name: HR-36BP & HE-48B

Contact: Tom Kellenberger

Date Product Introduced: January, 1987

Product Description & Applications: USS Home Studio Stands come in two sections. Home Recording Package (HR-36BP) is the studio "recording station," perfect for multi-tracks and computers. Includes acrylic writing surface, electrical outlet strip, second tier with two support bars for monitors and Half Tier (HT-15B) for drum machines. Stands 4' in back, 3' in front (height adjustable). Keyboard Extension (HE-48B). Attaches to the HR-36B. Includes one 48" Tier for keyboards and one Half Tier for sequencers.

Basic Specifications & Suggested List Price: USS Home Studio Stands are available in satin black anodize only. They come backed by a lifetime warranty. HR-36BP suggested retail \$280. HE-48B suggested retail \$105.

ULTIMATE SUPPORT SYSTEMS

PO Box 470
Fort Collins, CO 80522
(303) 493-4488

Product Name: Apex Column Stand

Date Product Introduced: June, 1987

Product Description & Applications: The Apex Column is a totally self-contained dual keyboard stand. Legs fold up and store in column base, while keyboard support arms store inside top compartment. Apex sets up or breaks down in under 27 seconds, without tools. Cord clips conceal cables for a clean look.

Basic Specifications & Suggested List Price: Construction: black anodized aluminum. Maximum column height: 46". Weight: 19 pounds. Price: \$199.95.



VOODOO TECHNOLOGY
TiComp

VOODOO TECHNOLOGY

3109 Scotts Valley Dr., Ste. 101
Scotts Valley, CA 95066
(408) 438-7412

Product Name: TiComp

Contact: Marshall Schaffer, president

Date Product Introduced: March 28, 1987

Product Description & Applications: Portable hand-held time code and film edge number calculator. Useful for on-location and studio calculation of durations, play times and trimming EDLs. Also supports time code film edge number conversion for multi-media editing. Calculate amount of film or tape that must be exposed to achieve desired play time, thereby reducing over- and under-shooting. Also works as a "regular" calculator, calendar, clock and diary.

Basic Specifications & Suggested List Price: NTSC and EBU time code compatible. 16 and 35mm film code compatible, 24 and 25 FPS. Optional RS-232 interface, 110 V power adapter, other software available. Calculator is fully programmable. Suggested price: \$340 plus postage, handling, tax.

WIND RIVER BOOKS

909 Elm St.
Denver, CO 80220
(303) 388-6121

Product Name: *The Broadcaster's Dictionary 1987*

Contact: Jim McDonald, owner

Date Product Introduced: April, 1986 Revised first ed. April, 1987

Product Description & Applications: New for 1987: dictionary of broadcast terms and technical/operating tutorials. Includes music and recording terms, digital audio and stereo TV entries.

Basic Specifications & Suggested List Price: 204 pages, illustrated, 8 x 11, new paper binding, new price \$18.95 +pp.

WIREWOKS CORPORATION

380 Hillside Ave.
Hillside, NJ 07205
(201) 686-7400

Product Name: "T-Series Products"

Contact: Angela DiCicco, customer service mgr. (800) 624-0061 nationwide

Date Product Introduced: Upgraded in 1987

Product Description & Applications: Including individual mic splitter boxes, direct boxes, amplifier input boxes and rack adapter to allow rack mounting of all T Series products.

Basic Specifications & Suggested List Price: Average list price of each T-Series product is under \$200, depending on model.

WIREWOKS CORPORATION

380 Hillside Ave.
Hillside, NJ 07205
(201) 686-7400

Product Name: CR1207 Cable Reel & TE-3 Cable Tester

Contact: Angela DiCicco, customer service mgr. (800) 624-0061 nationwide

Date Product Introduced: April, 1987

Product Description & Applications: Product line includes: multi-pin disconnectable stage boxes, trunks, tails, transformer isolated splitters, etc. Also available: hardwired mic multi-cables, microphone cables (prices recently reduced by up to 36%) new CR1207 Cable Reel and TE-3 Mic Cable Tester.

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by Lou CasaBianca

RANK CINTEL

FILM MEETS THE DIGITAL VIDEO AGE

Rank Cintel's new developments might be called, "Film Meets the Digital Video Age." Rank has introduced a digital output for its famed flying-spot telecine, conforming to full EBU TECH 3246/SMPTE RP125 standards. The product now makes possible direct 4:2:2 transfers from film stock to digital video tape or disc. Rank Cintel Digiscan 4:2:2, as the feature is known, is available to all owners of Rank Cintel Enhanced MkIIIC telecines as an upgrade option, and it will be sold as a standard feature in future models.

The Enhanced MkIIIC has already made possible new standards of visual excellence in commercial and motion picture post-production. "The digital flying-spot telecine is the cornerstone of any truly digital post-production facility," says Rank Cintel executive vice president Colin J. Brown. "And its many digital features even significantly benefit the analog video state-of-the-art digital imaging."

Digiscan 4:2:2 features parallel digital video outputs, and improves upon virtually all specifications of Rank Cintel's Enhanced MkIIIC, including heightened resolution to full REC 601 structure. Digiscan 4:2:2 samples luminance at 864 pixels per line—108 pixels per line more than the Digiscan 3 Enhanced MkIIIC. (Broader bandwidth and precisely controlled color channel filtering ensure improved color accuracy and resolution.) The telecine achieves a dynamic range of up to 1,000:1 on positive film, deriving significantly more detail from the black end of the light spectrum than has ever before been possible.

Furthermore, Digiscan 4:2:2 pro-

vides users with a unique reference input/output 4:2:2 framestore for instantaneous recall or continuous display of any desired frame. When equipped with a remote facilities panel, the framestore features a fully variable split-screen facility, allowing horizontal wipes between the telecine's output and the reference frame. Users thus can grab frames for comparison with the telecine's "clean" output to digital VTR, or use the framestore to monitor (on the normal telecine moni-

**Rank Cintel's
Enhanced
MKIIIC
Digiscan 4:2:2**



toring circuits) the match between the telecine and either a live digital camera or the digital playback feed.

Equipping the Enhanced MkIII Digiscan 4:2:2 with a new ancillary product, MatchBox, provides 4:2:2 frame storage of between 200 and 400 digital stills for establishing house style consistency, reproduction accuracy and sequence story boarding.

Rank Cintel Inc. is part of the Rank Precision Industries Division of the Rank Organization. Its U.S. offices are located at 260 North Route 303, West Nyack, NY 10994, (914) 353-1914; and at 13340 North Saticoy, Unit F, North Hollywood, CA 91605, (818) 765-7265.

Fairlight Video

Fairlight Instruments has released the Computer Video Instrument (CVI) Plus: the newest low-cost video effects and graphics generator from the Australian computer music pioneer. The CVI Plus has all the features of the Fairlight CVI as well as a number of significant additions: it is faster and easier to use because of major software improvements; a new hierarchical, icon-based menu system has dramatically reduced the number of main menus (from 22 on the CVI to just nine on the CVI Plus), thereby eliminating a lot of distracting and time-consuming menu switching. The Memory Module option for the CVI is included in the standard software for the CVI Plus. Title facilities now offer seven fonts plus a user-defined font, with 12 font variations and five sizes. Up to 100 pages of titles can be stored, and Title Library functions have been expanded to include insert and delete capabilities.

The system provides 108 brushes, and 108 textures now can be stored in memory with 36 user-defined brushes/textures. Brush, texture and character creation/editing systems have been integrated as well, allowing inter-exchange brushes, textures and characters. The sequencer now has a copy feature and a sequence naming feature. In all these areas, many functions now can be addressed by a computer-style alphanumeric keyboard, which comes standard on the CVI Plus or via the CVI's control panel, with its sliders, buttons and Koala pad.

The CVI Plus' new digital board now provides a "frame" store. This enables you to grab or create either one full frame image or two separate field

images for two-cell animation and other effects. Frame memory size now matches video image size exactly. So when a full-size frozen image is panned continuously, top, bottom and side "joints" between image are absolutely seamless. The digital board can produce many new effects, including horizontal and vertical reversals of live or frozen images, push on/push off and four directional wipes.

The new video (analog) board of the CVI Plus offers a substantial improvement in video signal quality, as well as improved chroma lock and sync. It allows for preprocessing of the digital picture for greater sharpness and provides separate input adjustments for the analog and digital paths. Both composite inputs have a delayed loop-through feature to compensate for the 1.3 μ s delay of the CVI input control, are easily accessible, and there is a separate genlock input for studio sync.

I.T.S. Handbook Sets Standards for Video Industry

The International Teleproduction Society (I.T.S.) has taken a major step toward standardizing operating practices throughout the video industry with the creation and publication of their expanded *Handbook of Recommended Standards & Procedures*, announced recently by Janet Luhrs, I.T.S. executive director.

The Handbook is designed to increase communication between facilities and serve as a catalyst for expanded business opportunities. Written in readable prose, it helps clients make their way through the video maze, establishes uniform standards for incoming personnel, standardizes industry procedures and expedites the movement of tapes between facilities. The I.T.S. membership has agreed to adhere to these standards and practices.

Handbook editor Doug Weiss (Andre Perry Group, Ltd., Washington, DC) was charged with assembling the vast amount of material contained in the almost 350-page volume. He notes that, "Ours is a rapidly changing and dynamic business, and we intend to continually update *The Handbook* to reflect these changes. Future editions will echo the decisions and collaborative efforts of our member companies in partnership with other responsible industry organizations and manufacturers."

The Handbook should provide producers, directors and crew members with an outline of the generally prescribed methods and procedures to be followed in the process of efficiently creating a finished video tape or optical disc. It not only explains what is done by the practitioners of production, post-production, audio sweetening and duplication, but also offers advice for those preparing their projects for these various phases of production. In addition, the book functions as a unifier, a reference to which all professionals can turn so that the standards and practices they follow are uniform.

The I.T.S. will distribute one complimentary copy to each member company, associate and independent members. Sustaining and founding members, because of their unique contributions, will receive a greater number of copies without added cost. Additional copies may be purchased through the International Teleproduction Society, Suite 21E, 990 Avenue of the Americas, New York, NY 10018, (212) 629-3266, at \$15 per copy for members and \$25 for nonmembers.

JVC Super-VHS

The next generation of half-inch video has arrived. It's called Super-VHS, which is said to double the sharpness available on current systems, an increase that exceeds the leap in quality from the LP to the CD.

Super VHS achieves most of its dramatic improvement in picture quality through a technique known as high-band recording. Television signals are made up of two components: a luminance, or brightness, signal that contains all the black-and-white information in the picture and determines picture sharpness. The color (or chrominance) signal that in effect paints the luminance image with color, was added later.

In S-VHS, the luminance signal has been moved from its normal VHS position between 3.4 and 4.4 MHz to a new location between 5.4 and 7.0 MHz, a much higher frequency range. JVC was also able to extend the signal by moving it into a higher band. The ordinary VHS luminance signal has a maximum range (or deviation) of 1.0 MHz. In S-VHS, the frequency deviation increases to 1.6 MHz. This converts into at least 400 lines of horizontal resolution in the final picture—more than 3/4-inch

video. Outside of the frequency shift, S-VHS uses the same frequency-modulated recording technique as conventional VHS. The recording process for the chrominance signal has not been changed.

S-VHS VCRs record hi-fi and conventional audio just like standard VHS decks. In general, S-VHS machines will also feature other circuitry improvements, including HQ, which further enhances luminance and chrominance signals by including special Y/C (Y for luminance, C for chrominance) input and output connectors. This keeps the two signals separate instead of combining them in one composite NTSC video signal. This helps prevent the visible artifacts, such as moire and dot patterns, that can result from interference between chroma and luminance.

S-VHS signals only can be recorded on S-VHS videotapes—a new breed of tape designed specifically for the task. The new tape is chemically similar to today's VHS and Beta tapes. (According to reports from Japan, S-VHS tapes use a cobalt-doped ferric oxide formulation offering coercivity about 20 to 30 percent higher than current VHS tapes.) In order to handle the higher-frequency signals, the new tape's magnetic particles have to be smaller and more uniform than those of conventional VHS. Using ferric oxide tape, instead of a metal powder formulation like those used in 8mm and digital audio-tape (DAT), allows the video record and playback heads in S-VHS to coexist with ordinary VHS tapes, an important factor which keeps S-VHS downward-compatible with existing technology. In order to lay down those high-frequency signals, S-VHS video heads need a gap narrower than that used in VHS (2.0 microns compared with about 2.6 microns). This narrow head gap pushes the limits of today's technology. The machines will be able to be switched to play the old format or the S-VHS tape.

A New Vision at SIGGRAPH '87

Interactive exhibits, educational art shows, video movies and digital technology were the dominant aspects of this year's SIGGRAPH (Special Interest Group Graphics) presented by the Association for Computing Machinery (ACM) in Anaheim, California, last

July. SIGGRAPH is the conference and exhibition of ACM's special interest group on computer graphics.

There were three major parts of the convention—the exhibits, the art show and the film & video show. The 1987 show was designed to provide exposure for a variety of media producers, and systems devoted to computer graphics, stills, holographics, 3-D imaging as well as digital motion graphics.

Joanne Culver of Lazerus in Berkeley, California, art show chairperson, and the art show committee, made a special effort to display "new art" work, from first-timers as well as recognized industry veterans. Culver determined the theme for the art show and submissions of computer art accordingly. The show's orientation was changed from a simple art exhibition to a more educational format, in acknowledgment of the fact that many who attend each SIGGRAPH conference are just entering the computer graphic imaging field. A decision was made to help show the connection between the images on display and the technology that helped produce it. Many of the art exhibits were accompanied by educational information, explaining what the person was seeing and exactly what role the computer had in the creation of the artwork.

The SIGGRAPH film & video show featured an incredible array of new work, spotlighting many forms of digital communications, with some of the most imaginative visuals ever created for the medium. It was a pleasing barrage of non-stop images. Categories of visuals included research, corporate communications, science and industry, broadcast computer graphics, fine arts, music visualization and theatrical motion pictures. The Anaheim Convention Center Auditorium, with sold-out shows of about 8,000 people each night, served as the forum for the presentation. The music selection and sound were well done and beautifully executed. The show featured a variety of technologies, including one-inch video, 35mm film, six-inch slides, a powerful, bright projection system and digital audio. MIDI sound effects, sound processing, reverb and digital effects were synchronized to the SMPTE time-code output of a one-inch video tape re-

coder. A laser and still image show projected on the side walls and ceiling of the center provided a dramatic intro to the whole affair.

Some works that were outstanding examples of the genre included: "Poliovirus," by the Research Institute of Scripps Clinic, an atomic resolution X-ray crystallographic studio of the human polio virus, that demonstrated immunological characteristics of this geometrically beautiful, but deadly virus; "The Quantum Mechanical Universe," by Jet Propulsion Laboratory, a humorous and highly educational introduction to the elementary concepts of quantum mechanics; "Ecology II, Float," from Nippon Electronic College, an abstract anamorphic depiction of life forms that could have existed in a Paleozoic sea—or on another planet; and "Red's Dream," by Pixar, a look at what unicycles dream about on rainy night.

Film & video chairperson, Joan Collins said that there are "people out there using computer graphics to design textiles, to visualize satellites flying through space, and do non-destructive crash testing. The show is also time coded, so there are no pregnant pauses." Frank Foster, film & video show technical director, added, "A large portion of the audio was actually first generation. Whenever possible, there was digital audio in sync with the films and video."

According to SIGGRAPH, the film & video show included more than 70 different contributors. Each had a production cost between \$15,000 and \$70,000 just to get the imagery ready for presentation. "A show of this magnitude can only be done on a not-for-profit basis," explained Collins. "If each contributor were compensated for rendering each frame in the show, the show's production cost would run over \$13 million."

SIGGRAPH '88 will be in Atlanta, Georgia August 1 through 5. For information on ACM activities, publications and videos contact (800) 342-6626. ■

Lou CasaBianca's primary interests lie in the areas of advanced music, film and TV production. He specializes in interactive authoring, visual design and the application of computers in media production.



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FEEDBACK

Dear Mix:

I'd like to address the readers of *Mix* magazine: Oppose any bills that would require anti-taping chips in DAT recorders! The CBS copyguard system design requires the electronic removal of a band of frequencies from music program. The copyguard scanner chip which would be required in a digital audio tape recorder detects that some of the music has been deleted and will then stop the recording process on the DAT machine.

The band of audio frequencies which must be removed in the encoding process to allow the copyguard scanner chip to operate is centered around 3.8 kHz. Some musical tones in this frequency band include the notes B, G, E, B-flat, F-sharp and D-sharp. These notes are not in some inaudible region, but are in the middle of the audio spectrum.

In order to prohibit recordings on DAT machines, record companies must use CBS copyguard encoding on all music released commercially. This will affect everyone who listens to music and grossly overshoots the targeted DAT recorders. This will also insure that DAT recorders will fail in the marketplace and deny the public a significant advancement in audio technology. The public ends up with adulterated music and *no* DAT recorders.

The CBS copyguard system is useless on all other types of recording systems, including compact cassettes, hi-fi VCRs, and open reel tape recorders. The public has been using recording devices since their invention. The Supreme Court has already ruled that the public may use video tape recorders for personal use.

The original intention of a copy-

guard system is to prohibit direct digital-to-digital copies of copyrighted music between digital outputs of compact disc players and digital inputs to DAT recorders. The CBS copyguard system is not required to prohibit this activity. The digital words containing the music have unused space in which to insert a code which will prohibit digital-to-digital transfers. These digital codes have absolutely no effect on the musical program. Prototype DAT recorders tested in this country already have this feature in their design.

Copyguard encoded music can never be restored to original condition! It is wrong to intentionally destroy some information in all music to protect it from DAT recorder technology.

Sincerely,
Gregory G. Davis
Danbury, CT

Dear Mix:

Nice to see the article on cabling systems ("Sound System Success," June *Mix*). While most of the article stayed within factual boundaries, I feel that the discussion on transformers ("The area probably least understood in interface systems") did in fact miss several very important points.

Contrary to what some people seem to believe, a 1:1 or 1:1:1 microphone bridging transformer does not significantly help alleviate loading effects on the microphone. With a 1:1 transformer, the microphone feeding the primary will see whatever load is hung across the secondary; if that is a typical mic preamp, it will be about 1,000 ohms. If the transformer has two secondaries, each loaded with 1,000-ohm mic preamps, the microphone sees two parallel 1,000-ohm

loads, which is 500 ohms. The only effect the transformer should have on the impedance seen is the addition of a (hopefully) negligible amount of DC series resistance from the windings themselves. The only way to eliminate this is to use an active split, also known as a distribution amplifier, in which each microphone feeds a preamp.

The actual causes of many mic-splitting problems are found in preamp designs. Many transformerless mic preamps use gain control methods which also cause some variation in input impedance. The problem is not apparent until two such preamps are fed from one microphone. A change in impedance results as the house mixer changes a gain control, unloading the mic slightly, raising its output level, thus reducing the gain needed at the monitor mixer, which generally causes a sudden screech of feedback and a lot of bad language onstage as the monitor engineer tries to figure out why levels keep going up and down.

I was also surprised to see that the subject of electrostatic or Faraday shielding in splitter transformers was totally ignored. (Not to be confused with the little black cans sometimes used for electromagnetic shielding, an electrostatic shield is constructed *within* the transformer to prevent stray capacitive coupling between windings—a major problem when dirty AC lines and grounds are involved.) If I understand the historical background of the Jensen JE-MB series of transformers, it was the necessity of having electrostatic shields for each winding that lead Jack Crymes and Deane Jensen to wind their first transformers. Mr. Jensen offered some fascinating off-the-cuff observations on the origins and princi-

ples of mic-splitting at a 1986 AES workshop called "Transformers in Audio." Among the points he stressed was the importance not only of each winding having its own electrostatic shield but also of the capacitance from each winding to the shield being balanced for optimum common-mode rejection. Rather than quoting hearsay on the subject I would rather entreat Mr. Jensen to share a bit of his vast wisdom with us on these issues—perhaps in a future *Mix* article.

Sincerely,
Scott R. Burnham
Director of Engineering
Pro-Co U.S.A.

Dear Mix:

I would like to correct some information we provided for your directory of recording schools in your July issue.

California State University Dominguez Hills offers B.A. degree programs in audio recording and music synthesis and is fully accredited by NASM. We are not, however,

accredited by either the AES or SPARS, as these organizations do not currently have formal accreditation procedures. We are listed in the AES Directory of Educational Institutions and participate fully in their programs and activities. We feel close contact with professional groups, such as the AES and SPARS, is an essential part of our students' growth and the ongoing development of our curriculum and teaching facility.

Sincerely,
John Hill
Assistant Professor of Music
California State University
Dominguez Hills

Dear Mix:

Dan Daley's article in the July issue on Paul Simon's concert in Zimbabwe was wonderful. I was particularly pleased to read something about Roy Halee. I had the pleasure of assisting Roy in 1976 and 1977 on many albums at what was then ABC Recording Studios in Los Angeles (now Lion Share). Roy was then and remains now the consum-

mate engineer and mixer. Roy starts from a high standard and never deviates. Zero is never plus or minus anything. His subtle touches make the records he mixes come alive.

Although *Graceland* has received the most recent press, listen to Paul Simon's last album, *Hearts and Bones*, in particular to "Train in the Distance." There's a wonderful tambourine part in the chorus... perfect placement; or the acoustic guitars in the title track. His use of echo is amazing.

I'm proud to consider Roy my mentor. It's sad to think that young engineers starting out now don't have the opportunity to learn from someone like Roy. *Mix* would do well by a complete article on Roy Halee.

Sincerely,
Leslie Ann Jones
Engineer/Producer
President, SF Chapter NARAS

Dear Leslie:

A story on Roy is already in the works and should be running in an issue very soon. Keep reading.

—FROM PAGE 8, INDUSTRY NOTES

Systems (Garden Grove, CA), manufacturers of MOSFET audio amplifiers, has appointed the following sales representatives: **On the Road Marketing** (201-746-0501) for the New York State area, including NYC; **Steffey Marketing Associates** (312-480-3575) for western Wisconsin and northern Illinois; and **Rick Smith Enterprises** (206-883-1482) for the Pacific northwest area, including Alaska... **Gary Castelluccio and Assoc.**, a marketing, consulting and manufacturer's rep in the audio field, has moved to a 6,000-square-foot office and warehouse facility at 57 Crooks Avenue, Clifton, NJ 07011, (201) 772-3333... **James Van Eaton** has been named vice president and general operations manager of **Grace & Wild/ Hollywood**... A KIA Electronics has been renamed **KIA Electronics** and has moved to 7393 Southwest 42nd St., Miami, FL 33155, (305) 264-4511... **Nick Morris** was promoted to VP/general manager of **Nagra Magnetics** in New York... **John Stiernberg** was appointed national sales manager for **dbx Professional Products**... **RF Specialties** of Seattle and Nebraska joined the **Logi-**

tek Instant Action dealer network... **Audio Engineering Associates** of Pasadena, CA, have opened **MIDI Works**, which will supply MIDI-based products including Sequential keyboards, the Studio 440 SMPTE-based sampler/drum machine, the Akai range of pro audio/keyboards and various supporting software. For more information, call (818) 798-9127... **American Audio Systems**, a supplier of sound reinforcement, recording, tape and educational systems equipment, has moved to new headquarters at 4834 Park Glen Road, St. Louis Park, MN 55416, (612) 929-4000... **Amek Consoles** named **Western Audio** Sales Representative of the Year for 1986. Western services the Southern California, southern Nevada and Hawaii markets... **Teldec GmbH**, of West Germany, walked off with this year's Maker of the Microphone Award, an annual trophy presented in memory of Emile Berliner for "an outstanding contribution to the world of sound." The award recognized Teldec's invention of the direct metal disc mastering system... **Vikki North** was hired as Paintbox artist by **Synoptics**, the L.A. special visual graphics and effects production service of Scanline

Communications... **Cubicomp** (Hayward, CA) has signed a letter of intent to purchase the Vancouver, Canada-based **Vertigo Systems International**. Cubicomp, which manufactures and markets the PictureMaker® line of professional quality 3-D graphics and video animation products, feels that the purchase of Vertigo, with its V-2000 family of 3-D computer animation systems, will enable them to have the most complete line of 3-D graphics systems... **Greg Thompson** has been hired as NEOTEK's director of visual design... **Jim Woodworth** has joined **3M International Tapetronics** as sales representative... **Steve Jenkins** was appointed vice president/director of affiliate relations for the **Westwood One Radio Networks** based in Culver City, CA. **John Brodie** was promoted to vice president/eastern sales manager... **Group Centre** has moved to new offices at 23950 Craftsman Rd., Calabasas, CA 91302, (818) 884-2717. The move corresponded with their ending distribution of Simmons Drums... **Bob Jorgenson** has joined **DYNAIR Electronics**, a manufacturer of routing switches, control and distribution products, as their application engineer...

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—FROM PAGE 24, SESSIONS

which featured Meat Loaf and Brian May from Queen at LA's **Record Plant** and **Westlake Studios**. Also at the Record Plant, Lyons mixed the official instrumental theme for the games, recorded by **Tangerine Dream**, which Lyons composed. . . At **West Side Sound** in LA, Atlantic artist **Larry John McNally** remixed "The Beat Generation" and is cutting tracks for his next record with **David Schwartz**, engineer. . . Florida-based rock group **Rated X** have completed recording five masters with producer **Dana Strum**, recorded and mixed at **Baby-O Studios** in Hollywood. . . **Olivia Newton-John** has been recording her new MCA album at **Studio Ultimo** in West LA. with producer **Davitt Sigerson**. **Beverly Jones** is the engineer with **Mitch Zelezny** assisting. Also in recording a new album for CBS is **Earth, Wind & Fire** with **Maurice White** producing. . . Activity at **South Coast Recording** in Santa Ana included a second album for **Higher Ground** on Chapel/Bridge Records with **Jim Dotson** engineering. Also **David Carey** engineered a remix of **Untold Fables**' EP. . . Producer **Steve Diamond** was recently at **Ignited Productions**, Hollywood, remixing a tune written by himself, Micky Thomas and Craig Chaquico for Starship. Ignited's chief engineer, **Paul Klingberg**, engineered the session. . . Producer **Skip Drinkwater** was in Burbank's **Red Zone Studios** recording several tracks for **Chico De Barge**'s new Motown album, with **Dave Bianco** engineering and **Steve Shepherd** assisting. . . Motown artist **Georgio Allentini** completed tracks at Studio City's **Fidelity Studio** for his debut album *Sex Appeal*. . . **Michael McDonald** has been working on his next project at **41B Studios** in Westlake Village, with **Ross Palone** engineering. . . At **Rumbo Recorders** in Canoga Park was **Richie Zito** producing PolyGram artists **The New Frontier**. **Phil Kaffel** engineered and **Julian Stoll** assisted. . . At **Image Recording** in Hollywood, Studio A has been hosting producer **Peter Wolf**, re-editing tracks for **Wang Chung** with **Bino Espinoza** at the desk and **Steve Krause** assisting. Wolf also worked on an upcoming release for **Kenny Loggins** with **Ron Da Silva** assisting engineer **Brian Malouf**. . . Singer **Rex Smith** has been busy in Hollywood at **Golden Recorders** cutting tracks for some soundtrack work with young producer/writer, **Chris Curry**. . . **Supertramp** mixed their new album for A&M Records in Studio A at **Larrabee Sound** in LA. Grammy award-winning engineer **Tom Lord-Alge** manned the console, with the assistance of **Jeff**

Lorenzen; Rick Davies also is producing this project. . . At **West Oak Recorders** in Canoga Park, **Phoebe Snow** was in doing a duet and background vocals with **Dave Mason** for his upcoming album release on Voyager (MCA) records. At the console producing with Dave and engineering was **Jimmy Hotz**. . . The **New Monkees** were in at the **Village Recorder** in West LA. overdubbing and mixing with producer **Mike Slammer**, engineer **Charlie Brocco** and assistant **Tom Biener**. . . At **Jam Power Studio** in Northridge, former Miss America **Vanessa Williams** began working on a solo project with **Rex Salis**. . . At **Conway Recording** in Hollywood, **Aaron Zigman** and **Jerry Knight** produced **Natalie Cole** for Manhattan Records. Engineering was by **Daren Klein** and **Mick Guzowski**. . . The **Red Hot Chili Peppers** were in at the **Music Grinder** in LA. working on their new album for EMI Records. **Michael Beinhorn** produced, **Casey McMackin** engineered and **Matt Freeman** assisted. . . Paramount Pictures' movie *Back to the Beach* had **John Boylan** producing **Aimee Mann**'s song, "Sign of Love" with **Paul Grupp** engineering with assistance from **Bret Newman** at **Sound City** in Van Nuys. . . **Brenda Russell** and **Stanley Clarke** have been in at LA's **Elumba Studios** putting the finishing touches on her new A&M album, *Get Here*. **Andre Fischer**, producer of Brenda's first A&M album, co-produced most of the album. . .

STUDIO NEWS

The **University of Southern California** has installed a 56-input SL 4000 E Series console in a state-of-the-art recording facility specially created to service its Graduate Certificate and proposed Bachelor of Science in Music Recording programs. . . **Take One Recording** in Burbank, CA, has taken delivery of a Mitsubishi Westar 48-input console with Compumix automation and a Mitsubishi X-850 32-track digital tape machine for their facility's new room. . . **Counterpoint Studios** in NYC has added a new state-of-the-art MIDI room, which features Otari 24-, 4- and 2-track tape machines, a Trident 70 console and Westlake monitors. . . The **Mobile Control Room** is a new remote recording service based in Nashville, TN. It's a master-quality on-site audio facility which can interact with all levels of video and broadcast production. Housed in a 22-foot steel security trailer, the MCR offers multi-track recording, a customized Quad-8 console,

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a Nakamichi DMP-100 digital processor with a Sony SL-2000 VCR, and much more . . . Recent sales of the Amek BCII audio production console include **Trans America Video** in Hollywood, CA, for sound effects mixing; **Editel** in Hollywood for television production and **Howard Anderson Co.** of Santa Monica, CA for film-to-video transfer. . . **Sheffield Audio-Video Productions** in Baltimore, MD, recently added a Neve 8068 MKII recording console to their audio remote truck. The console was purchased from **Ircam Studio** in Paris, France. . . In August, **Starlight Sound** in Richmond, CA was purchased by engineer/producer **Bill Thompson** and producer **Neil J. Young**. Starlight will continue to operate a full-service automated 24-track studio. New additions include a complete computer sequencing system based around the Atari 1040ST with Steinberg Research software. . . **Capron Light & Sound** of Needham, MA, picked up a DDA D-Series console for house sound reinforcement configured with 40 theater inputs and eight matrix outputs. Most recently it was used with Frank Sinatra, Jimmy Buffett and the Boston Pops. . . **Elumba Recording Studios**, owned by African and European recording star Patience Dabany, installed Solid State Logic SL 6000 E Series consoles at their premises in Holly-

wood and Africa. . . **SounTec Studios**, a Norwalk, CT-based recording facility, has added a video sweetening studio. New equipment installed includes a 16-track fully automated Sound Workshop console, Otari MX-70, Otari MTR-12, Otari MX-5050 B, Sony BVU 850, Adams-Smith 2600 synchronizer and more. . . **StudioStudio** is a new \$2.5 million 24-track recording studio, located near the Galleria in North Dallas. The large LEDE™ control room houses a Harrison 3232 series console with 48-input capability and "Auto Set" automation. The tape machines are all MCI/Sony: a JH-24 multi-track and two JH-110 2-tracks. . . Recent equipment acquisitions at **Tarpan Studios** in San Rafael, CA, include the Fairlight CMI Series III system. . . Facilities recently purchasing TimeLine Lynx SAL synchronizers include **MGM/Lorimar** (six units) and Chicago's **Streeterville**, which bought seven SAL units. Studios adding more Lynx sync modules include **A&M Recording Studios** (Hollywood) and **Sigma Sound** and **Soundtracks** of New York City. . . **Acme Audio & Recording Company** in Chicago has added 34 Nakamichi BX-300s to its duplication division. **Audio Consultants** of Evanston, IL, supplied the machines. . . **Secret Sound L.A.** is the first studio in North America to receive delivery of the new Studer A820 24-

track digitally controlled analog tape machine. They also received the first of the new generation Studer CD player and cassette recorder—Models A727 and A721 respectively. . . In Atlanta, **New Age Sight & Sound's** PCM 3324 24-track digital recorder was linked up with **Criteria Recording Studios'** 32-track Mitsubishi digital recorder for the audio mixing of **Madonna's** performances in Japan to be televised nationally in the United States. The recording will be released on laser video disc and video also. . . **Newbury Sound**, a 24-track audio and video post-production facility in Boston, has installed Digital Creations' "Diskmix" SMPTE-based automation system. The Diskmix system, which is installed in an IBM-compatible personal computer, provides the means to store up to 99 different mixes of a song, without using tracks on the 24-track machine. . . **Downtown Sound** is a new full-service multi-track (24+) recording facility located in the heart of Dallas' historic West End district. Downtown Sound's offerings include: video and audio synchronization; music libraries; the Southwest's largest collection of vintage tube microphones; a complete MIDI facility with staff engineer/programmer; a large selection of outboard gear; and a large selection of musical instruments. . .

STUDIO · VIEW

—FROM PAGE 30, STUDIO VIEW

at the cost of the money you are borrowing. If you can get a rate of say 11%, which is a very good rate these days, you have to add that cost to the purchase price and divide it by the years of useful life. That way, you can determine what that piece is going to cost you each year, each month and each week. You also have to be aware that there are private sources of financing, even international sources, at lower than bank rates, but you really have to dig to find them.

In some cases you can find someone who has money to invest and can only get 7½% at the bank. You can offer them 8% secured by the assets of the studio in case it goes belly-up. They're happy because they can get more for their money and you're happy because you are paying less money. In the case of buying a \$300,000 console, the difference between 8% and 11% can be as much as \$30,000, which is a lot of money. If you are making a lot of money and need the tax write-

off, leasing may be your best bet. But in my case, I can use the assets more than the write-offs, so purchasing makes more sense. You also have to look at depreciation. In my case, I chose to go with a longer depreciation to maximize my tax avoidance. [Note: Tax avoidance is legal, tax evasion is illegal. Also, many open-ended lease contracts—those with a buyout provision—can be considered purchase contracts under the new tax law, so consult competent tax and legal counsel.]

Mix: What do you do with the gear you're replacing? Do you keep it and use it or do you sell it?

Skye: My policy is that if we can't use it, we get rid of it. We either sell it to our clients or, if it's a piece of character equipment, we sell it through a broker. We deal with several equipment brokers, and they provide a valuable service. There used to be a time when I wouldn't sell anything, but those days are over. I found that, to keep a lot of gear around, you have to have a lot of time to play with it and a

lot of real estate to store it or you might as well turn it into something useful.

Mix: Do you rent out gear when it's not in use to recover some of the investment costs?

Skye: Sure. We do it with a lot of the smaller effects because they tend to be incredibly expensive. If we have a situation where someone who is tracking for several weeks and they have no use for the effects, we'll rent it out and let somebody else take care of the payments.

Mix: How do you cope with obsolescence?

Skye: That's simple. Don't buy anything. ■

Tony Thomas has been involved in broadcasting, recording and publishing for over a decade. He is managing director of Target Communications International, a full-service ad agency, broadcast production firm, and MIDI-based recording studio based in Southern California.

—FROM PAGE 6, CURRENT

an audible effect or not. You have to temper that with the fact that that was somebody else's product that I was listening to. If it were my own product, I might be able to tell."

David Collins, technical engineer at Digital Magnetics in Los Angeles, noted that "It was certainly audible in Capitol Records' Studio A. Myself, Bruce Botnick and Paul Rothchild could probably have picked it 70% of the time. There is no way that this thing is going to be inaudible. From what we know about digital audio and sharp analog filtering and harmonic displacement of audio signals, any kind of midrange notch is going to be death. There's no way anyone can claim inaudibility."

Glenn Meadows, whose Nashville mastering house, Masterfonics, hosted the Nashville listening sessions, observed "I couldn't detect any loss that I could pinpoint. Whatever changes were occurring due to the sliver of audio being removed were so virtually inaudible that in our mix room I couldn't

honestly tell you when the filter was in and when it was out. It was that clean. I wouldn't have any problem working with a producer on a project and encoding his product as we went, and having the ability to flip it out during a portion of the music if it became audible."

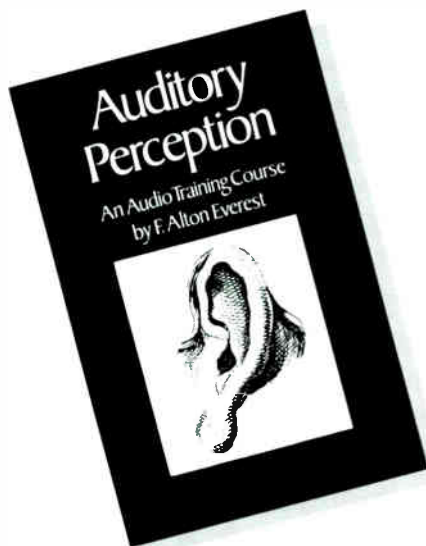
Meadows went on to generalize the reaction of the Nashville listening group. "We had between 50 and 75 people for the sessions. Not one person in the discussion admitted or stated that they could detect any degradation to the audio. The people who came in who were dead set against it, who thought they could detect it instantly, went out shaking their heads in disbelief."

Whether the copy-code will provide an effective remedy to record bootlegging is unclear, though a vocal record industry supports any effort to control the rampant piracy problems. Says Gordy, "It especially hurts new artists. Let's say one of my artists sells 10,000 records first time out. Let's say that another 10,000 of those are bootleg, or copies that could have sold otherwise.

That could mean the difference between whether an artist is dropped or kept. [Illegal copying] is going to hurt a lot of new music. You're going to see record companies putting more pressure on an artist to perform a commercial product, and that hurts music. In other words, an artist goes in with the idea that 'this record has to sell,' not 'am I putting good music on tape?' The bottom line is, if we don't do something about tape piracy and copying, we're going to go under, it's going to ruin the whole recording industry."

The National Bureau of Standards (NBS), by the request of Congress, is currently undertaking a study of the effectiveness of the system, a procedure that is expected to take two to three months. In recognition of the NBS test, the Subcommittee adopted an amendment that will allow the Secretary of Commerce to withdraw the copy-code system if it is determined by the NBS to "audibly degrade" the sound quality of the music or be easily bypassed.

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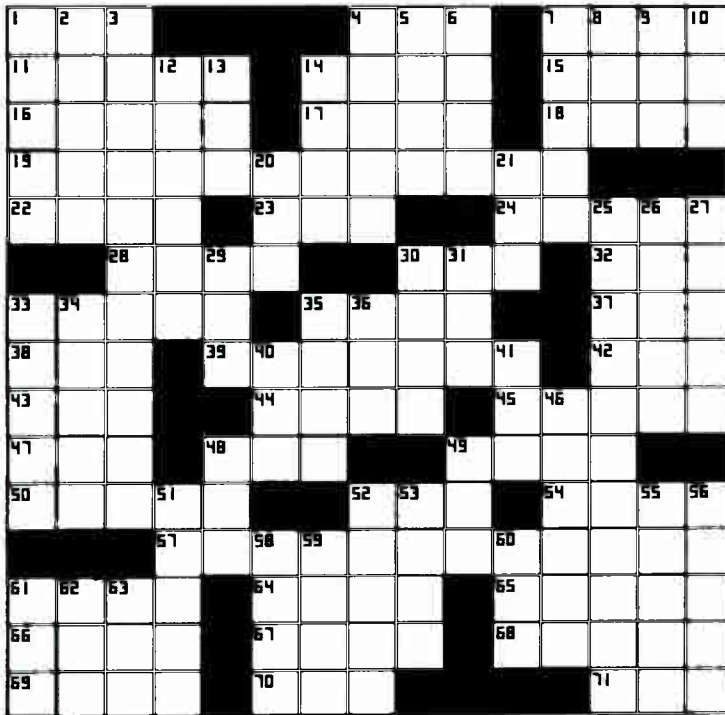
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MIX WORDS



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SEAGOING SOUND

ACROSS

1. Hipster's physique
4. Musician's program
7. "I Got You, _____"
11. Curacao neighbor
14. Ms. James
15. Terrible guy
16. A parent's sibling
17. Cable or cajole
18. Burns & Allen theme "Love _____"
19. Undesired low-frequency oscillation
22. Mulligan
23. Canadian prov.
24. Cringe
28. Audio sketch
30. Latin lesson verb
32. Famed coach
33. Island in 48D
35. Uncivil
37. Brewer's item
38. Conquistadore's obsession
39. Can happen on a ship or a track
42. Brooklyn or pentagon suffix
43. French sea
44. Per _____
45. Demolishes
47. Not ext.
48. Velvet Fog singer
49. Big rig
50. Sub-continent system
52. Resort
54. Irish alphabet
57. Troublesome charges in speakers and transformers
61. Nada, in Nice
64. Genuine Spanish coin
65. Of Joshua's altar
66. Another 13D
67. Pianist Hines
68. Farm implement
69. Go bad
70. Cause to see red

DOWN

1. Oz creator and ilk
2. Ready _____
3. Speaker cabinet options
4. Weasel
5. French state
6. Water _____ in Venice
7. "Eureka" to certain old ladies
8. Roman greeting
9. _____-relief
10. Tolkien treeman
12. Fan
13. Gaseous prefix
14. Bus. school subj.
20. Halloween greeting
21. Lance cpl., e.g.
25. O-scope undulations
26. Recording function
27. Assesses
29. Wire measure
30. Dutch product
31. Mil. grp.
33. Type of opera
34. Large venue
35. Fencing item
36. Tiny Tim's twanger
40. Dutch commune
41. Before
46. Protozoan
48. "Middle of the Earth Sea" for short
49. Babylonian number for 60 60's
51. Coltrane's ax
52. Cause to jump
53. Push-_____
55. Certain trees
56. Letter heading abbr.
58. Number of operatic pennies
59. Terrestrial cycle
60. Confederate
61. Ethiopian title
62. Japanese statesman
63. Flightless bird

Solution to September Mix Words



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