FOR THE PRO & SEMI PRO

the Mix

RECORDING INDUSTRY DIRECTORY

VOL 3 ISSUE 3

MAY 1979

Listings: New Products

Doug Sax
Making Better Records

Drum Miking
by David Teegarden

Fiber Optics
by Dr. Richie Moore

AES in Brussels

FREE

Why settle for a copy . . .

when Tangent gives you the original?

Why settle for an imperfect copy of your sound, when Tangent will give you the original?

Tangent's crystal-clear transparency allows your original sound to flow cleanly to the tape, with only the coloration that **you** add.

And beyond this foundation of solid quality, Tangent invites comparison on these features:

Automation
Automation from Tangent uses the innovative and widely-respected Allison 65K programmer and Fadex designs. Tangent chose the Allison system because it is **the** proven-in-the-field system.

VCA Grouping
For those not needing full automation, Voltage Controlled Amplifier (VCA) Grouping utilizes up to **nine** VCA groups, while other manufacturers normally use fewer.

Sub-Group Solo
Programmable Sub-Group Solo allows the engineer to solo an entire sub-group in place by pushing only one button. This convenience is not found in all competing VCA grouping or Automation systems

Semi-Parametric EQ
Three-band sweepable frequency equalization on each channel is a standard Tangent feature. Not an expensive option as with some competing systems.

Transformerless Balancing
Transformerless Balancing keeps your original sound pure with incredible transient response. Noise is within 3 dB of the theoretical limit.

Transformerless Balancing is suddenly a big deal among the other console manufacturers. It should be. Tangent's been doing it for years.

16 Submasters
Tangent's 16 submaster busses plus "Direct" allow tremendous flexibility for 16 or 24-track work.

FET Switching
Electronic FET switching silently rearranges the signal flows for maximum convenience and minimum repatching.

Lots of Extras
Penny & Giles faders, multiple Echo and Cue send, Phase Reverse, Tape Return Gain, and many other features on each channel give full professional control and reliability.

Compare Tangent's features to consoles costing twice as much and you'll see what a value Tangent is.

As for comparing Tangent's quality, well, you just can't get better than the original.

Tangent Model 3216 AVAILABLE AT THESE DEALERS:

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Audio Concepts, Inc
Dave Kelsey Sound
7138 Santa Monica
Hollywood, CA
(213) 851-7172

The Express Sound Co.
1833 Newport Blvd.
Costa Mesa, CA
(714) 645-8501

tangent
MUSICAL ENGINEERING
2810 South 24th Street/(602) 267-0653
Phoenix, Arizona 85034

the Mix
Recording Industry Publications

The Cover:

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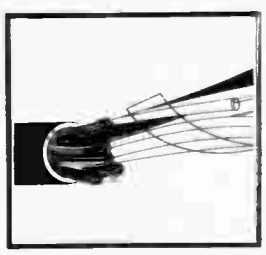
A special thanks to the staff of Sound Genesis 2001 Bryant St., San Francisco for the use of the facilities and equipment.

MAY 1979 VOLUME 3 ISSUE 3

FEATURES



LISTINGS

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tracks

pressing problems and active solutions....

The quality of recorded sound is the driving force of our industry. In the studio, we knock ourselves out going for low distortion, high signal-to-noise, and wide frequency response. As we climb to higher rungs on the ladder of fidelity, the contrast between our studio product and the corresponding disc in the record store becomes discouragingly obvious.

Record manufacturing in this country has not kept pace with the available technology. It is not fair that the most critical listeners and those of us who value the capabilities of our music playback systems must tolerate inferior record quality, geared for a nondiscriminating silent majority. That silent majority, however, is spending about twice as much on stereo equipment and records as it did just five years ago, and its ears are becoming increasingly critical to the shortcomings of today's records.

In our feature interview, Doug Sax discusses the problems relating to disc manufacturing and offers some available solutions and improvements. Doug, a one-man crusade for better record quality for over twenty years, has been heading the current direct-to-disc movement as well as supervising the cutting of premium-quality lacquer master discs at the Mastering Lab. From Doug's unique vantage point, the key to improving record quality in the near future is the producer.

Not to assume that advancement in the studio has peaked out, several of our features deal with the new technologies opening up to us. Dr. Richie Moore has contributed his views on how fiber optics will revolutionize and simplify studio electronics in the near future; the digital and analog realms are the subject of Larry Blakely's "Progressions" column; and, for the studio builder, Dennis Paoletti has submitted "Architectural Acoustics for the Small Studio."

Nearly 250 new products, many of which are being shown for the first time at the Spring Audio Engineering Society Convention in Los Angeles, are introduced in our listing section.

New Beginnings

June 9, 1979, will bring us two events in the music industry. The first is the Spring NAMM Convention, in Atlanta, where over 350 musical instrument manufacturers will be showing thousands of products for musicians. The second event will be the premier issue of Mix Publication's new, free, M.I.™ (Musician's Industry) Magazine. A publication **for the active musician™**, M.I. ™ Magazine will provide valuable information and exciting reading, and will be distributed free every other month to the major music and recording centers throughout the country.

M.I.™ Magazine will deal with new developments, ideas, and products in the fast-growing and dynamic world of the musician. Techniques and applications will be regularly explored to assist musicians in understanding their environments on stage, in the studio, on the road, and with their personal goals.

Interviews, reviews, and documentaries of well-known performers will present technical, meaningful information that will be of interest and use to other musicians. Regularly, M.I.™ will be listing new products in the industry to provide updated information ***for the active musician***™ and to keep him or her in close touch with the ever-changing musical environment.

Steve Caraway, Managing Editor for M.I.™ Magazine, has been deeply involved in both the Pro Audio and Music Publications industries for many years, with experience as Assistant Editor and Advertising Director of Guitar Player Magazine, Advertising Director of Modern Recording Magazine, and Editor and co-founder of Sound Arts Magazine.

Assisting Steve as Associate Editor is John Lescroart, previous editor for Guitar Player Books and Records and past Advertising Director for Guitar Player Magazine. John also brings to M.I.™ eight years of experience as a professional musician.

The first issue of M.I.™ will cover a wide spectrum, with articles on the Music Industry, Techniques and Applications, The Performer, and a listing of new products that have been introduced since June, 1978. Features will include "On The Road With The Charlie Daniel's Band;" a long look at Hartley Peavey — the man, his inventions, his business philosophy; and a wide-ranging interview with Graham Nash, with a special focus on his use of the acoustic guitar. M.I.™ will also provide recurring columns with titles like "State-of-the-Art" (on Mesa-Boogie this issue), "String Symposium" (by Dean Markley), and "Research and Development" (by Buck Munger). "In concert" reviews of national recording acts will be gleaned from a variety of locations (California, New York, and Nashville in the first issue), featuring the top guitarists, keyboard players, drummers, and vocalists performing today. M.I.™ Magazine promises to be the definitive word ***for the active musician***™ — his or her link to the continuing state of the music industry, and an exciting reading experience.

inside

Our microphones are more often heard than seen.

We really don't have to broadcast the virtues of our equipment.

Especially if you've ever broadcast on our equipment.

Infact, go into almost any professional facility, and it'll be easy to spot Sony. With one exception:

Our miniature omni-directional electret condenser mike. The ECM-50PS is so small, you'd never expect such big performance. Yet this tie-tac microphone offers a wide frequency response, with full coverage from any direction.

On your visit you'll also come across the Sony C-37P. This is a professional condenser mike that's at home on stage or in studios. This versatility is enhanced by a selector switch that lets you go from omni to uni-directional. And thanks to FET circuitry, the 37P boasts a remarkably wide dynamic range, allowing sound pressures of up to 154 dB.

With the ECM-56F, Sony moves in the direction of a uni-directional condenser microphone. Offering Sony's exclusive Back Electret design, this unit combines a wide frequency response, with uncanny smoothness.

The Back Electret also sets the ECM-53FP ahead. The microphone: a flexible Cardioid for desk or podium.

The Sony C-74 microphone (not pictured), is a gun-type. You'll often see it at news conferences, where loaded questions are asked. This uni-directional condenser microphone is acknowledged as the standard in its category.

It's no stranger to theatres, sound stages, large halls and television studios. When you can't get proximity, make sure you're not at a distance from Sony.

Sony's line of microphones is as complete as you'll find anywhere.

But it also has Sony's disciplined quality and on-going perfectionism. Which you won't find anywhere.

SONY®

62nd CONVENTION BRUSSELS 1979

by Karen Ravich

Karen Ravich is a professional conventioneer and freelance writer whose work appears in Rolling Stone and Hi-Fi Trade News. She also makes a great spaghetti sauce.

Brussels is a beautiful city and even in the cool gray drizzle of early spring, it affords a certain warmth making it ideal as an international gathering place. This ancient town, marking its 1,000th year in existence, is also the administrative center of the Common Market. Against this background of old and new, the 62nd AES Convention was held March 13 - 16 this year at the Sheraton/Manhattan Complex. 120 exhibitors were on hand, representing 16 countries, including the U.S. It is estimated that there were over 2,000 attendees at the show. European membership in A.E.S. is about 1,600 (one-sixth world-wide total), and the Brussels presentation demonstrated a healthy increase over the 1978 Hamburg Convention which boasted 100 exhibitors.

The technical sessions were well-attended and varied. They featured areas such as "Studio and Recording Techniques", with papers presented by representatives of Sennheiser, Philips and others; "Loudspeakers and Sound System Design", and "Spatial Sound Record/Reproducing Systems". The tutorial session, "Applications of Digital Technology to Audio Recording", given by Dr. Tom Stockham of Soundstream, and the final day presentation of several papers concerning "Digital in Audio Technology", is proof of the high interest level in digital abroad as well as in the U.S.

The physical aspects of the Brussels show were pleasant and attractive, and a number of indoor 'cafes' made it possible to sit and listen to the potpourri of languages without having to leave the exhibit hall. The most noticable difference between this convention and those held in the U.S. was a matter of 'scope'. That is, the Brussels show was clearly dominated by manufacturers who are geared to the recording studio industry. American A.E.S. shows seem to have a slightly broader scope in that they overlap into what's sometimes dubbed the 'semi-pro' market and even into the realm of home equipment.

Steve St. Croix of Marshall Electronic was part of the American contingency and was on hand to demonstrate the Model 5002 "Time Modulator", the P-250 Pre-Reverb Delay and the P-500 Half-Time. Placed between the two modulators in the rack was the Marshall 5050 Stereo Effects Expander, which St. Croix says functions to control and generate new effects, and to perform as a master control for the modulators, interfacing all three units.

Otari occupied a spacious area in order to highlight several machines including the MX5050 Series, and the MX5050B, a ¼", two-channel recorder, as well as a duplication systems and the MX7800, a 1", 8-track recorder with digital tape timer with LED readout. In the forefront, however, was the new MTR-90, 24-track, 2" tape machine featuring a transport which is a pinch-roller-free direct drive capstan. National Sales Manager, Steve Krampf said that 2½ years of research and development are behind the MTR-90. "We've listened to everybody", he claimed, "we talked to over 20 studios about what kind of features they wanted. The machine reflects that, it suits the market."

Soundcraft Electronics, a London based company, introduced the Series 3B 24-group console series which has up to 32-track monitoring, 4 band sweep frequency equalizer, high and low-pass filters, and 8 auxiliary busses. Also featured was the new Model SCM 381-8, a 1", 8-track professional tape recorder for studio or location use.

Ursa Major was on hand with the new Space Station, demonstrated in Brussels by Chris Moore. The unit, model SST-282, is a digital delay line and digital reverberation synthesizer with controls including initial delay, decay time, room size and high and low frequency equalization. The Space Station also features a built-in mixer.

Harrison Systems, from Nashville, previewed components from their film recording console which is to be introduced in May in Los Angeles. Also displayed was the Alive programmable console for live performance work.

Solid State Logic showed the SL 4000, and SSL interactive studio computer. This console provides computer control of tape machine and cue point, among others with CRT monitoring.

Another English exhibitor, Audio Kinetics, brought the XT-24 Intelocator for search action on MCI, 3M and other tape machines. It has an inches-per-second speedometer and programmable routines for automatic sequencing. The new QLOCK 210 is a multi-microprocessor SMPTE generator/synchroniser able to locate and lock two audio-audio or audio-video tape transports.

California's Quad Eight introduced the Coronado automated recording console with up to 40 inputs and outputs, 33 frequency equalizers, and Penny and Giles faders.

Klark-Teknik Research featured the DN 71 digital controller which enables the DN 70 digital time processor to generate sound effects such as flanging and harmonizing. Also displayed were the DN 34 analog time processor and a line of graphic equalizers including the DN 27, one-third octave.

AKG of Vienna was on hand featuring a redesigned proto-type of its new rack-mount BX 5 reverberation unit. According to Product Manager Norbert Sobo., "The BX 5 provides high quality studio reverb in a new low-priced torsional transmission line system." The unit has independent controls for left and right channel with a unique equalization section.

In one of the few exhibits showing consumer products, JVC debuted its new digital audio processor intended for home use. The unit, which will be available in Japan in early summer, has no model number as yet and no definite price, although a spokesman for JVC estimated the cost at one-tenth of current digital equipment from other manufacturers.

Midas Audio Systems, London based, showed its versatile P.R. System. According to Sales Manager David Solari, the first Midas VCA controlled theater console is slated for Opryland and a second and larger console has been sold to RSO. The console allows different scenes to be pre-set and cross-faded and is a modular system.

Electro-Voice touted its Model 1724 lavalier mic and shared space with newly acquired Tapco. This may well have been the debut of Tapco products in a European Show.

JBL featured two studio monitors, the 4313 control monitor and the 4310E. The 4313 is a three-way monitor with a 250-mm low-frequency driver, in a compact system.

Other American companies represented at A.E.S. Brussels included BGW Systems, Shure, Dolby, dbx, and W.H. Brady.

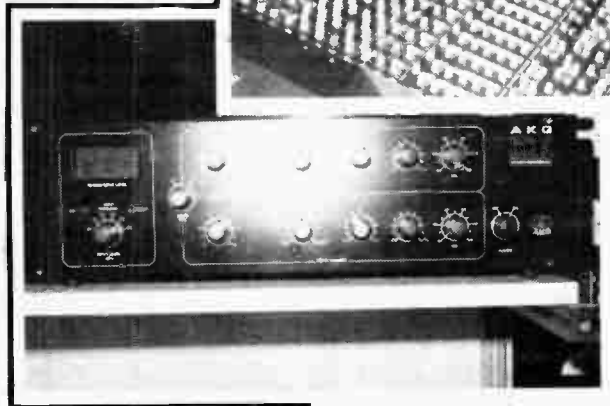
Everyone seemed to be looking forward to the Los Angeles show in May with great interest and enthusiasm.

Calrec's Margaret Smith and the Soundfield Microphone

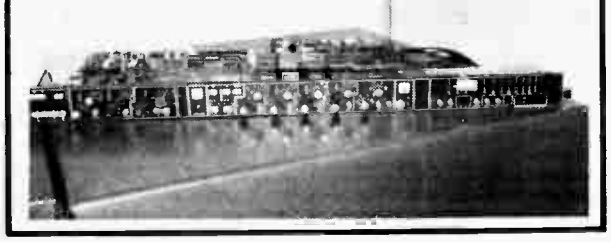
The Marshall Rack
P-250 Delay
P-500 Delay
2 Time Modulators
and the 50-50

Solid State
Logic Console

JVC's New PCM
Processor



AKG's
BX-5
Rack Mount Reverb



Harrison
Film Board Module

BUY THE TIME YOU NEED TO DO IT WRONG.

Sometimes you get exactly the sound you want. Other times, it's a bust. That's why you go through the endless hours of practice and rehearsal. And that means you need the time.

More than anything else, owning a multitrack recording rig gives you all the time you need. To practice. To make mistakes and change your mind. To experiment and develop.

The process starts with the multichannel recorder. Specifically, our A-3440 —the new standard for four tracks on ¼-inch tape with sync. Rugged, reliable and very fast to operate, the A-3440 uses one button per track for Record/Playback status and dbx* Encode/Decode switching. It has a built-in 4x1 headphone mixer, memory rewind for fast tape checks and pitch control for added production flexibility.

The key to controlling your sound for recording and mixdown is the mixer. For the right balance between real multichannel recording flexibility and low cost, try our Model 2A (shown here with optional MB-20 meter bridge and sideboards). Six inputs drive four separate outputs. Each input has switchable mic/line mic attenuation (to reduce overload distortion), bass and treble controls (±12dB at 100Hz and 10kHz), color-coded channel assign buttons, pan (for stereo balance) and slide fader level control. There's a master fader for overall level control. And lots of mixdown flexibility with the Model 2A's patch points. You can hook up external equalizers (like our GE-20), reverb units, any signal processors that will help you get the results you want.

If you're just getting started, get our free 16-page introduction to multitrack recording called "Are You Ready For Multitrack?" And if you're already cutting tracks, invest $4.95** in "The Multitrack Primer," our 48-page guide to setting up and using a multitrack studio, with special emphasis on never before published ways to conquer acoustic problems typically found in the home studio.

Just write us. Or better yet, pick them up at your TEAC Multitrack dealer. Then get your hands on the tools that give you all the time you need.

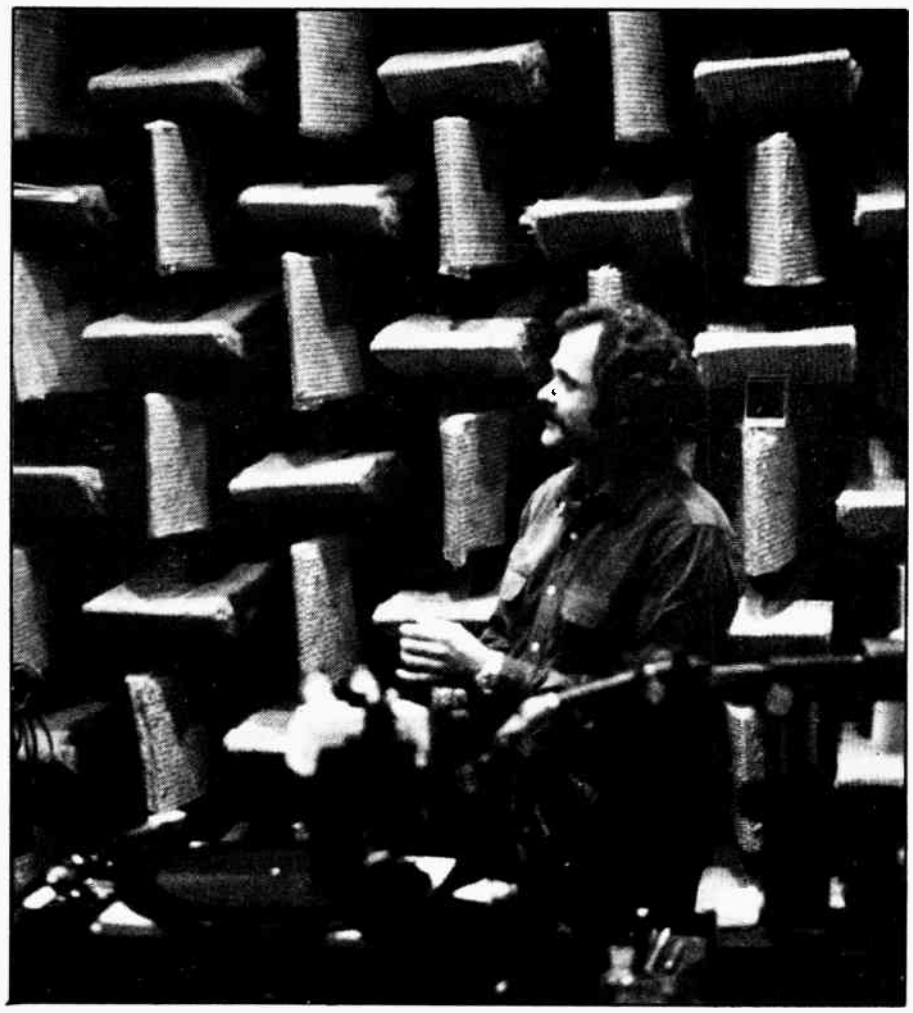
TEAC®
Multitrack Series

*dbx is a registered trademark of dbx, Inc. The dbx unit is available optionally. **Retail prices are determined by individual TEAC Multitrack dealers.

DOUG SAX

MAKING BETTER RECORDS

by David Schwartz



Doug Sax is building a direct-to-disc recording studio adjacent to the old MGM sound stage in Culver City, California, the best-sounding large recording room he has ever heard. A twelve minute drive from the MGM studio, Doug's quarter million dollar record matrix lab will take his lacquer disc hot off the lathe and have it plated down to stamper before it has had a chance to lose any of the energy that was so carefully put in the grooves. As president of Sheffield Records and the Mastering Lab, Sax has emerged as the leader of the current direct-to-disc movement.

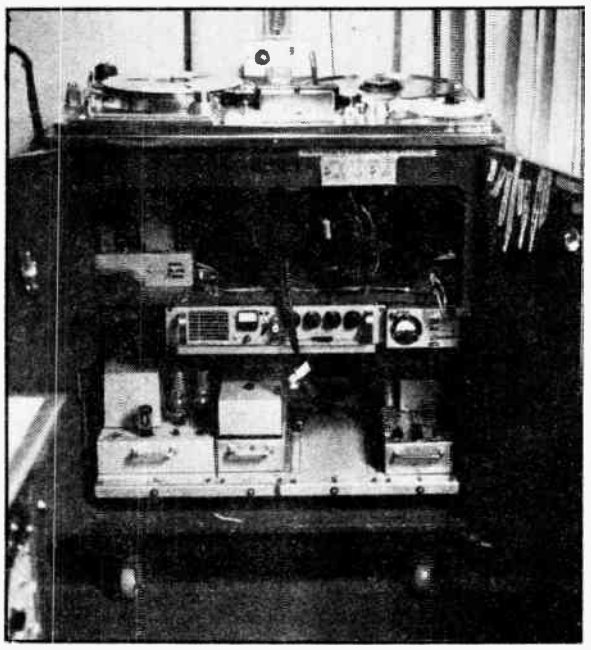
Record quality has been a major concern of Doug's since the early hi-fi days when he, his brother Sherwood, and Lincoln Myorga began experimenting with cutting lathes and getting a piano to sound like a piano. Gradually Doug became an authority on cutting lacquer discs from master tapes. This critical process put Sax's Mastering Lab on the map.

Although the Mastering Lab has been "officially" closed for 3½ years and only does work for a handful of engineers and producers with whom they've had a long association, the Lab manages to cut the lacquers for an average of about 15% of the top 100 selling records in the country. This figure is down from the 25% average that the Lab maintained when the room with two lathes was running 24 hours a day, six days a week, in the late '60s and early '70s.

One more startling statistic indicating the Lab's commitment to recorded excellence is this: 50% of the albums nominated for the Grammy Award for Best Engineered Recording by the National Academy of Recording Arts and Sciences (NARAS) in the past six years have had their master lacquers cut by Doug and the Mastering Lab.

Innovative and never compromising, Doug maintains a research and development wing at Big Bear Lake where Chief Engineer Bud Wyatt designs better microphones, loudspeakers, and electronics with the aim of bringing Doug's dreams of perfect disc quality closer to reality.

In our interview with Doug, he retraces his roots in the industry and makes a remarkable announcement about how we, as engineers and producers, can significantly improve record quality in a very short time.



Mastering Lab's Ampex 200 tape machine

What brought you into the recording industry?

Before the word 'hi-fi' was coined, my brother Sherwood, built a 'hi-fi' set for us. This was back in 1945 or '46, when I was just a kid. We were enthralled with sound reproduction and, as we'd get a little money, we'd improve our 'hi-fi' set. About that time we had a high school friend named Lincoln Myorga. Lincoln had been signed with Capitol records, backing the Four Preps, when he was in high school. Now, he had something no one else ever thought of in high school — he had money! It was unheard of.

He came over to my house one time and heard his first hi-fi set — mono — played loud, and asked my brother to build him one, which he did. Lincoln listened primarily to classical piano recordings and would always be asking me, "How about this?" and "How come this doesn't sound that way?" and I would throw in my two cents worth. Eventually he came up with the prime question, "Why do my old 78 rpm piano records sound better and steadier than my LP recordings?" This was the late '50s, and I said, "You know, maybe it's the tape recorder." I thought it was a good guess because those old 78's were made direct to the disc. So then I said, "If we could find someplace to record without the tape recorder, we could take that home and if it was better, that would prove it." Well, it didn't prove it, but that was the test.

So we went driving down Melrose Blvd. in L.A. and passed this old condemned studio, sort of a funny chopped-liver studio called Electro-Vox, run by an old man named Gottschalk. We went in there and said, "Can you still go right into the lathe?" and this old man Gottschalk snorted, "sniff, sniff, yes, snort". I said, "Six of them — well, which one of them is your best lathe, your steadiest lathe?" He pointed to one and I said, "Fine."

We set up an RCA 44 on a little Steinway grand that he had and I asked him, "Could you cut it at 78 microgroove?" I figured the high speed would be steadier. So he ran his lathe up to 78 rpm. Lincoln picked two selections, one on each side, both Chopin, that had long sustained notes — dee dee dee da duum. It cost us $10 and took about forty minutes. We paid him, got a 10-inch, double-face 78 ref (reference disc), and we ran home to hear if it was steady. Well, I had never heard, and Lincoln had never heard, a live acetate, and at 78 microgroove your signal-to noise on the acetate probably is in the 80's below zero, dynamic range is 95 and it gets to be an incredible medium.

Do you mean you could cut with 95dB of dynamic range twenty years ago?

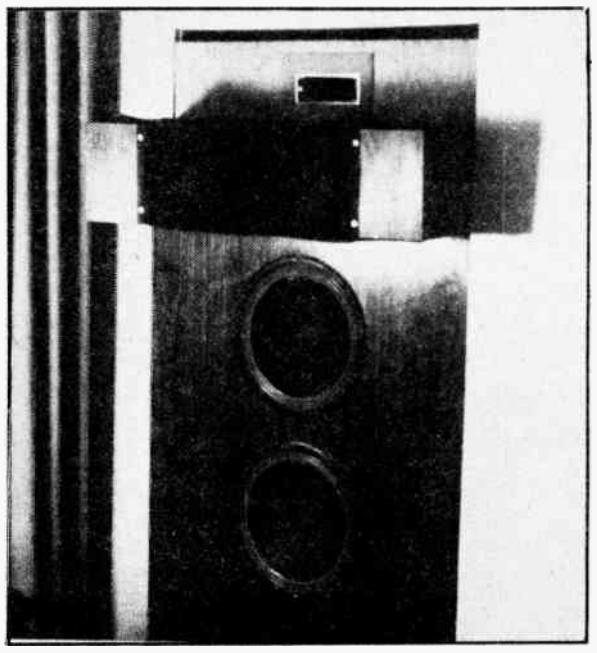
At that time, oh absolutely. Now lacquer has been lacquer for thirty years. And 78 microgroove with a Burner stylus and all that stuff is just a phenomenal medium.

So, we put the thing on, of course, and we turned it up, and the first thing we heard was absolute silence. And then nice piano came in. And Lincoln, because it came on the silence, was really infuriated. He said, "Damn! They recorded it too hot! They're gonna have too much level. It's all gonna break up on the loud sections," and I said, "That's not the purpose of the test. The purpose of the test was if it's steady? Forget that it'll break up, is it steady?"

Well, it was gorgeous. And, it was steady! I couldn't believe it! And when it started to build Lincoln said, "Oh, it's gonna break up." But it went through the entire build without one bit of distortion and we were sitting there going, "Huh? How do you do that?" Then we figured that if we could get that good of a sound with old beat-up equipment, imagine if we went in there with a new modern Scully lathe and did this and that, and that's when we started to try and make a record.

"In about six months I'm going to make a very big industry pitch to a large congregation of producers in order to improve the quality of records in this country. The quality is available. I have it. I've been thinking about this for years and I'm going to put it in their hands and, two months after this meeting, you will be able to have super quality recordings. All the power is with the producers and what they have to be shown is the alternative."

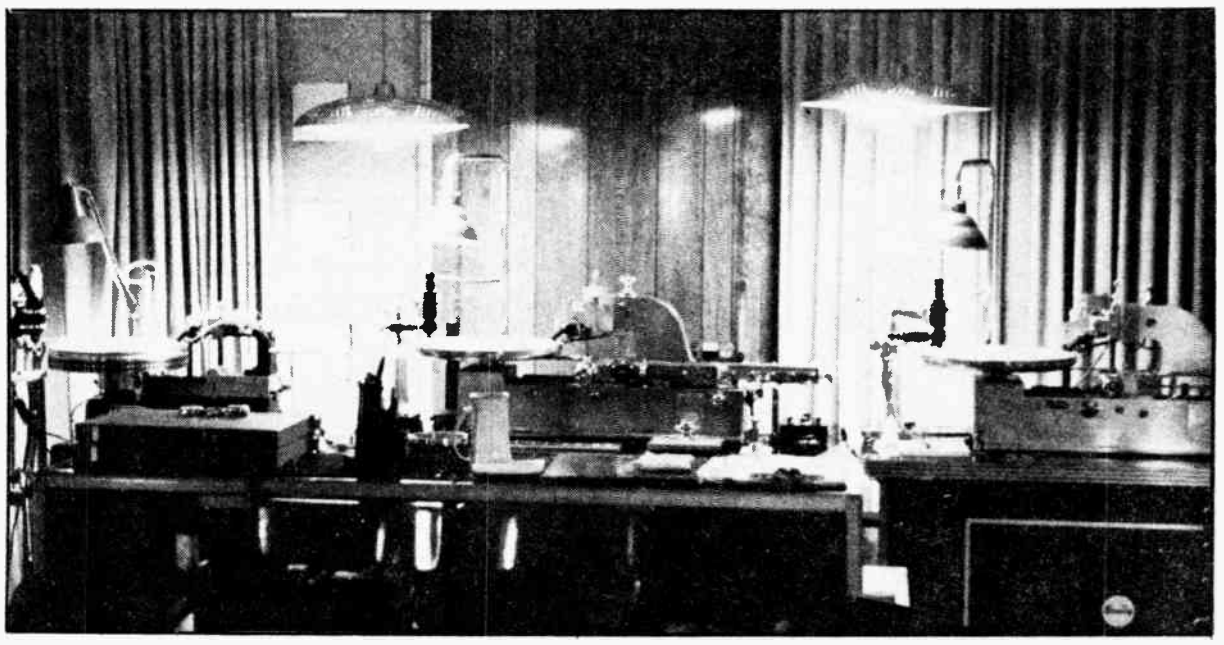
Sounds like the seed was planted for your direct-to-disc work. Where did you cut your first serious disc?



The Sheffield custom monitor

There was one cutting system in L.A. which was a Neumann; it was a mono cutter, and we did tests on that cutter on that lathe, and we got it — flat response, excellent attack, clean as a bell. You name it, it did it. But the room where it was just had no life. It was a mattress-lined room. Now, I had still not gotten into the industry yet and Lincoln and I were just going down with my brother's assistance and trying to do our dream and make a record. Well, we went back to this old Electro-Vox studio which has a very live room that's very complimentary to a piano, and my brother made up a small board.

We borrowed some microphones from Armin Steiner, and put in a class A 75dB phone line that was all run out from there to International Sound where the Neumann was, and got quite an excellent sound over the line. And Armin — I remember to this day — we built a speaker on which to monitor and it was over at International. Armin came in and was listening to the speaker and he said, "Really, you know considering that phone line, very remarkable. You know, if we could get something like that off of the record, it would be terrific. It's just so quiet and gorgeous and clear and everything." And at that time the pianist, Lincoln, who was down at Electro-Vox, walks in and he says, "It does sound good, doesn't it, Armin?" And he goes... "How can you be....?" And they were playing back one of the discs off of the lathe. Armin said,



Mastering Lab cutting lathes; Neumann on left, Scully's on right

"My God! It's fantastic! We're gonna do it!" And we jumped up and down, and Lincoln went back, and the next night we started recording.

It was shortly after that point that Lincoln said, "Boy, this could be a good business," and I said, "Yeah, let's have our own business and do it right." And that's when I gave up the trumpet. So we pooled our money, my brother designed and built the equipment, and I've been in the business ever since.

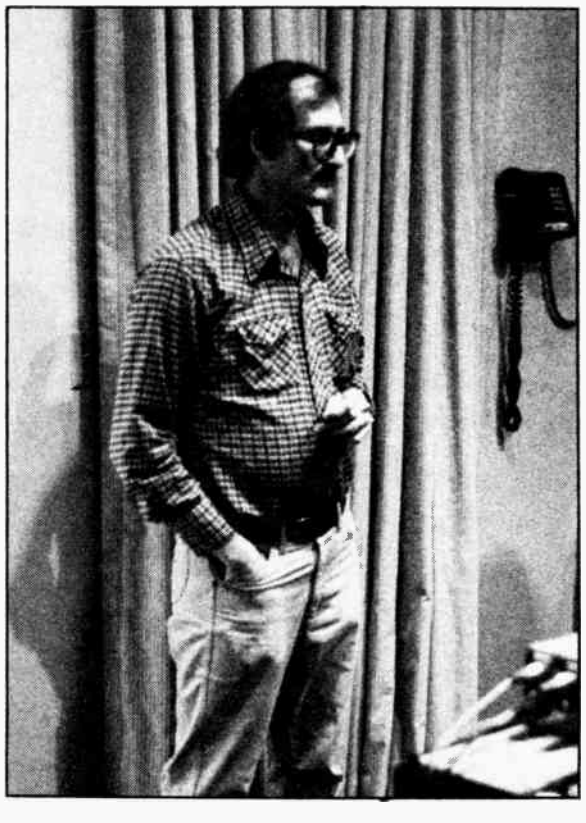
And that was, what, early '60s?

In '65 we joined our partnership, and it took us two and a half years of building. We did it on a budget and if Neumann would have had their system, we would have bought it. The reality is that they didn't have a system that we wanted to buy at that time — they do now — and the second reality is that we couldn't afford it if they had had it. We bought our lathes at auctions and they're still running. I can tell you one thing, guaranteed, there's no lathe in the world that has cut as much product as ours. There can't be. Because that's been in continuous operation since 1948. And there's no tape recorder in the world that's cut as much product as that Ampex 200 tape machine. It's just physically impossible. That tape machine had been the prime tape machine of Radio Recorders, but we bought it and it's run out of here ever since. I couldn't imagine how many millions of records have come off of that one tape machine.

How did Sheffield Records get rolling?

When Lincoln Myorga wanted to form a record company in the '50s, we were going up to see his mother who had just moved to Santa Barbara. We were searching for names and asked ourselves what other record company names conjured up for us. Capitol — the top, head of government, etc.; Columbia — majestic, blah, blah; and just then we turned off the freeway and saw the street sign, Sheffield Drive. Because of the English company (Sheffield) that makes precision steel cutlery, it sounded good to us.

The original logo came from the town hall that Lincoln saw when he visited Sheffield, England. As we started producing audiofile level recordings, we changed the Sheffield logo to a Morning Glory and Lincoln used the other logo under the label of Town Hall Records.



Richard Doss, Sheffield's matrix expert

"The producers are the heart of the industry. They're the guys that eat the cold pizza and they are the only guys who will fight to get their record mastered where they want. And if you open up another option to these guys, so they could come out the door with better quality on a project they have worked so hard on, they'll fight for it."

And Sheffield began doing some great direct-to disc projects. As a musician you must have gotten a thrill out of the music at some of those sessions.

Doing direct-to-disc has really brought out the best. On Thelma Houston's "Pressure Cooker," the music jumps off the record. The people in the studio were unbelievable and the energy was exactly what you would hope to get by putting a bunch of good musicians in one room. What we were setting out to prove was that you can have your cake and eat it, too, and that music at its absolute best is made with all of the musicians in the room relating to each other and feeling each other's energy. I know that I got it on the L.A. Philharmonic sessions (Sax's first MGM sound stage sessions) and we have it in spades on the Thelma Houston sessions. More records should be made this way.

What can we do about the quality of records made from the more conventional multitrack means?

In about six months I'm going to make a very big industry pitch to a large congregation of producers in order to improve the quality of records in this country. The quality is available. I have it. I've been thinking about this for years and I'm going to put it in their hands and, two months after this meeting, you will be able to have super quality recordings. All the power is with the producers and what they have to be shown is the alternative.

Where did you find the weak link in the reproduction chain?

In a word, matrix. I happen to be a symphonic musician — I played trumpet. Somewhere along in my early twenties I got just as interested in recording and in the acoustics of what happens to orchestras playing the music. One of the things that has always driven me up a wall, though, is that I don't like to take the records that we have very carefully done and apologize for the tics here and the clunks there and the damaged stamper. It can only make us look bad. So it became increasingly apparent to me that we had to get into an area that I didn't really want to touch — the record matrix, the metal parts made from the master lacquer.

So you started doing your own matrix?

I finally bit the bullet and hired Richard Doss, the finest record matrix man I know. He is able to take the best that we can achieve in a lacquer and give us quiet, perfect metal with all the highs that usually get lost in the matrix. We did a detailed search and outfitted our matrix lab with what we thought was the best matrix equipment available.

Incidentally, I predict that independent disc mastering will be the next big area. Some enterprising individuals will set up state-of-the-art matrix and they will show producers that with excellent matrix they can have a pressing that sounds like their reference disc, that has the full highs, the space, the echo, the punch, and quiet surfaces. It will be like when producers found out that their tape could be better handled by an independent disc masterer, a specialist who cared about the quality of the master and now, as we all know, there are many facilities that are doing very excellent lacquer work and are pleasing the producer. And that's the bottom line.

So it's back in the producers' hands.

The producers are the heart of the industry. They're the guys that eat the cold pizza and they are the only guys who will fight to get their record mastered where they want. And if you open up

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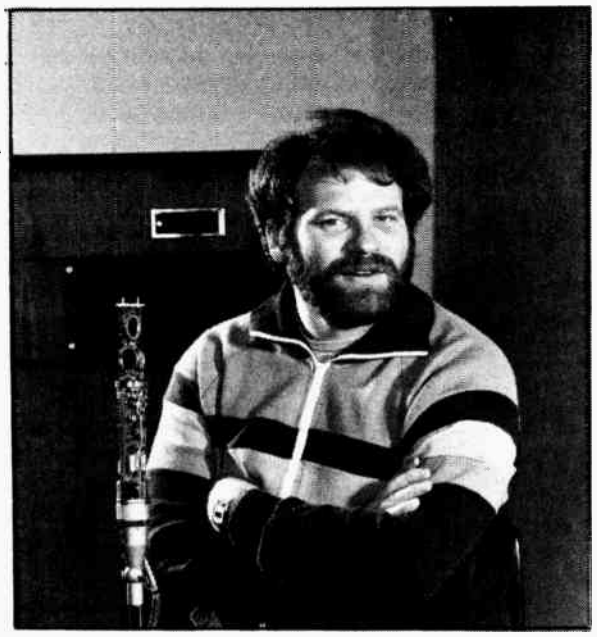
Photo by D.J. Meredith



Bud Wyatt, Chief Engineer of Sheffield Labs

another option to these guys, so they could come out the door with better quality on a project they have worked so hard on, they'll fight for it.

We did a matrix just recently for Val Garay, a very fine engineer and producer, on a project that he produced called "Leah Kunkel." He got his test pressings and was just thrilled. He said, "I compared it to the ref and it's every bit as good as the ref — in fact I'm not sure it's not better than the ref!"

Val is going to play the test pressing for somebody and he'll hear the highs. Then he'll play the normal one that rounds off the high end and makes the mid-range harsh, loses that clarity which he had achieved and which your standard good tape recorder is perfectly capable of reproducing and which the disc medium is capable of putting on a record.

Val's next album is James Taylor, with Peter Asher producing. He said to me, "Peter's heard this and you've got to do the matrix on James Taylor."

It's a very small industry and you get a few guys like this — and Peter Asher's going to run around somewhere — and if somebody set up a matrix with the kind of quality we're talking about, producers would start breaking down walls to get it. That's why I say it's going to be the next big thing. It wouldn't be me doing it, though, because I don't have the production setup.

It seems crazy that, as advanced as our technology is in this country, we don't press better quality discs.

The most advanced technology by far is in this country. When you sit at home and watch your color pictures of Jupiter — it's so far beyond anything anyone has done — picking up a radio signal 340 million miles away and processing detail that you can't even see on your TV set. What we can't do is press a quality record for 38 cents. But nobody else can either and we are the only country that tries to get a good record that cheaply.

I served on the NARAS committee to nominate the best recordings for the Grammy Awards. We listened to 177 records — these were records off the shelf — and it was absolutely revolting! On some of these records we couldn't even play the first cut. They were so warped, and any quiet passages in the music just came at you in a sea of garbage. I was just incensed that people were paying $8.98 for that. And yet you can go down and get a Deutche Grammophone classical record of a full symphony orchestra, imported, duty paid on the entire production cost, for $5.98, and you open up that sleeve and it's jewelry. Something has got to be done here.

How much would it cost to put out a good disc?

For thirty cents more per disc, labels could put out a super quality record. They could charge one dollar more for these records, the way they did with the quad discs, and make a special section for them in the record store. Now I think the main resistance from the record companies is going to be that if they offer super-custom, state-of-the-art records for a buck more, they are in fact admitting that the standard one is not a fine pressing. But this really throws no curves at the record company. If the head executive says, no one will buy that, they'll all buy the regular one, well fine, you've still got your regular one. What he doesn't know is that there is a market for it. And the producer has to be the one to tell him.

"Incidentally, I predict that independent disc mastering will be the next big area. Some enterprising individuals will set up state-of-the-art matrix and they will show producers that with excellent matrix they can have a pressing that sounds like their reference disc, that has the full highs, the space, the echo, the punch, and quiet surfaces."

You said that you don't want to be the one to do a matrix production shop, although you just built one. Is this just for a few loyal clients, the way the Mastering Lab operates?

I've just spent a quarter of a million dollars on my new matrix facility and the point of the thing is that I can't make any money with this. I can make records that I won't apologize for. If I put the same amount into a studio or another lathe room I could show a whole bunch of income. But I've got the income I need; I want to get the quality.

Once we get a good matrix, what do we do about vinyl and pressing plants?

That's why I'm pushing on RCA. They don't have to do any new engineering. Whatever they did when they did CD-4, they just have to do it in stereo. I'm talking about what the industry already has — not Never-Never Land — I'm talking about two months away once we get on it.

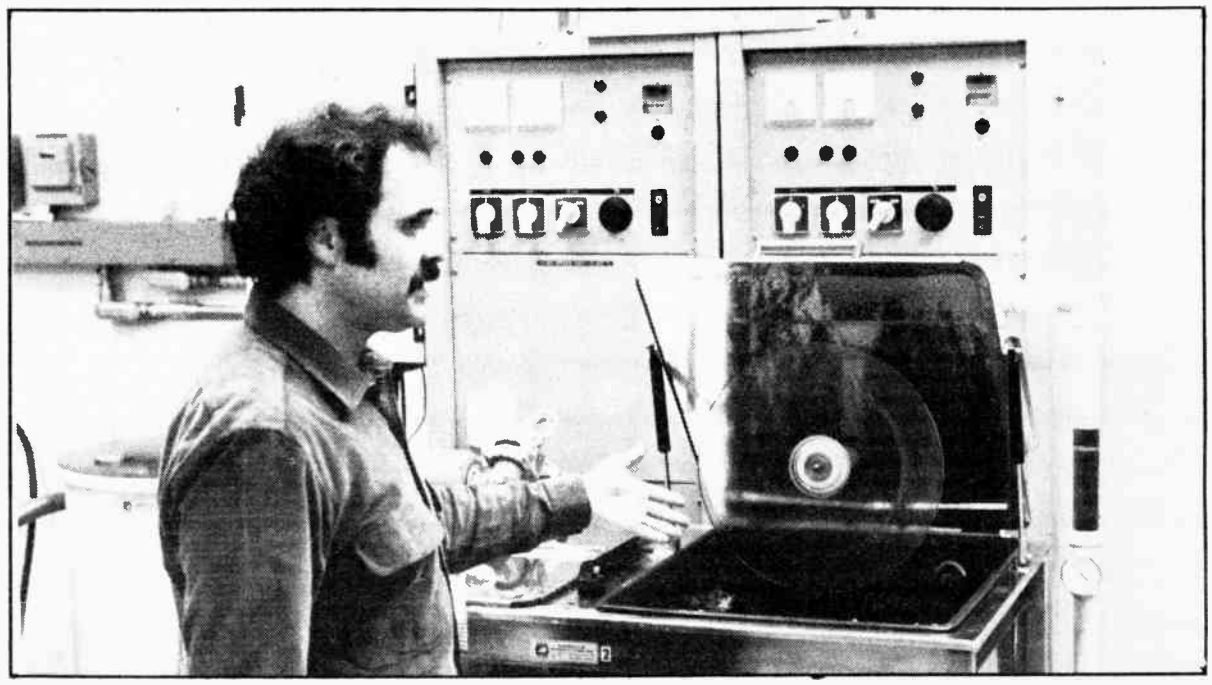
How do you see the sequence of events for getting this pressing?

I'll give you an ideal circumstance. We cut six sets of lacquers for Columbia and two sets for Dick (Richard Doss at the Sheffield matrix lab) and Dick makes up ten sets of stampers. I send these stampers to RCA and they press it in their quad vinyl. You could then put RCA's record on, compare it to the reference disc and the ref will lose! RCA's disc will sound better because their material conveys energy better than lacquer can. I'm talking about a record that you can buy and when you put that needle on and, if it's something that's supposed to stand you up, it's going to make you jump right out of your seat.

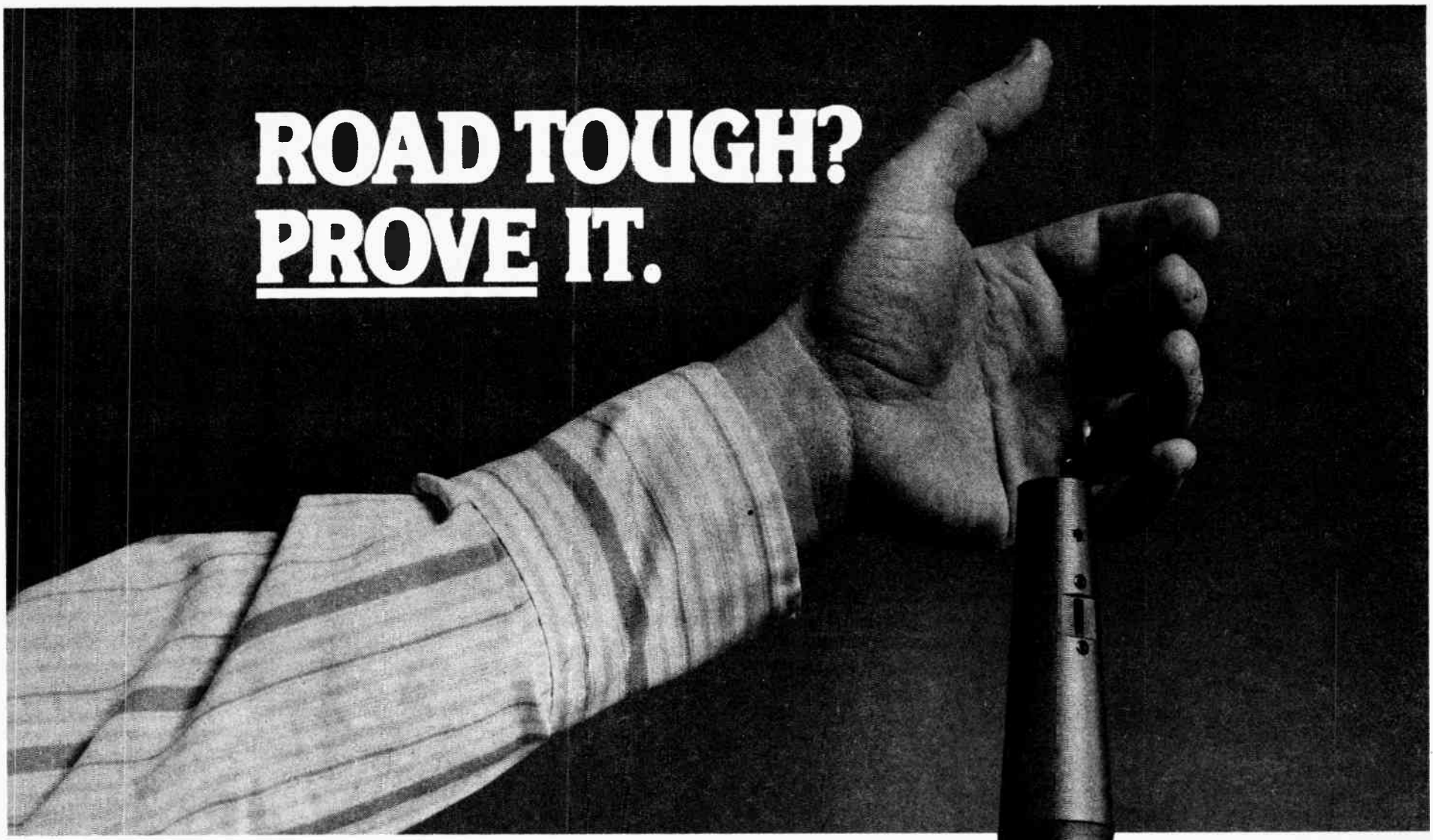
I have pressed my own records in RCA quad vinyl and the records never sounded as good before or since. Flat statement — I guarantee it. You put the needle down and those speakers light right up. And that vinyl is just sitting there! Now if you went to RCA and said, "Go out and develop a vinyl," it would cost hundreds of thousands of dollars and they would say, "Get lost." But if I said, "You know that good vinyl that you made up for quad? Make up some more because I've got producers who are going to be sending me lacquers who want that vinyl." The engineering is done.

Sounds like a dream come true.

The real miracle was Edison's telephone because everything in our business is nothing more than an improvement upon the telephone. The miracle is that a diaphragm vibrated by a voice can go to another diaphragm and vibrate the air and you hear a voice. Why it doesn't sound like a vibrating tin can is the miracle and all the rest is just better diaphragms on either ends and better connections. I don't know how in the world he did that. It shouldn't work.



Doug at the plating bath in the new Sheffield matrix lab



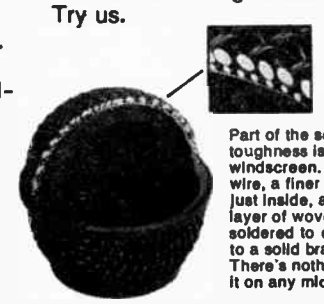
It's six long feet to the floor. What will happen when our great sound hits bottom? How long will it still sound great? We had to find out. So we picked an ATM41 Dynamic and an ATM91 Fixed-Charge Condenser out of stock, tested them, and started in.

Each was dropped seven times on its side from six feet onto the office floor. Nothing much was happening. So we repeated the series, this time dropping each microphone on its nose. Seven times from six feet. Still no problems. They looked good and sounded good, but *we* were getting tired.

So we moved to an unyeilding slate floor. Here it took three more drops on its side from six feet, and three more on its nose from four feet to finally affect the ATM41. A truly remarkable record!

But what about our ATM91 Fixed-Charge Condenser? It should have given up long before a dynamic. But quite the contrary! The ATM91 withstood four side drops onto slate from six feet, three drops right on the nose from four feet, and another six drops on the nose from *six* feet and still tested OK for sound! Granted it looked anything but new, but it *still performed*.

Our little test left us arm-weary but convinced that the ATM Series microphones could easily earn their "Road Tough" name in the field. That's the testing which really counts. Try us.



Part of the secret of ATM toughness is this 3-layer windscreen. An outer heavy wire, a finer wire screen just inside, and an inner layer of woven bronze. All soldered to each other and to a solid brass ring. There's nothing else like it on any microphone.

This ATM91 survived 27 drops from as high as 6 feet!

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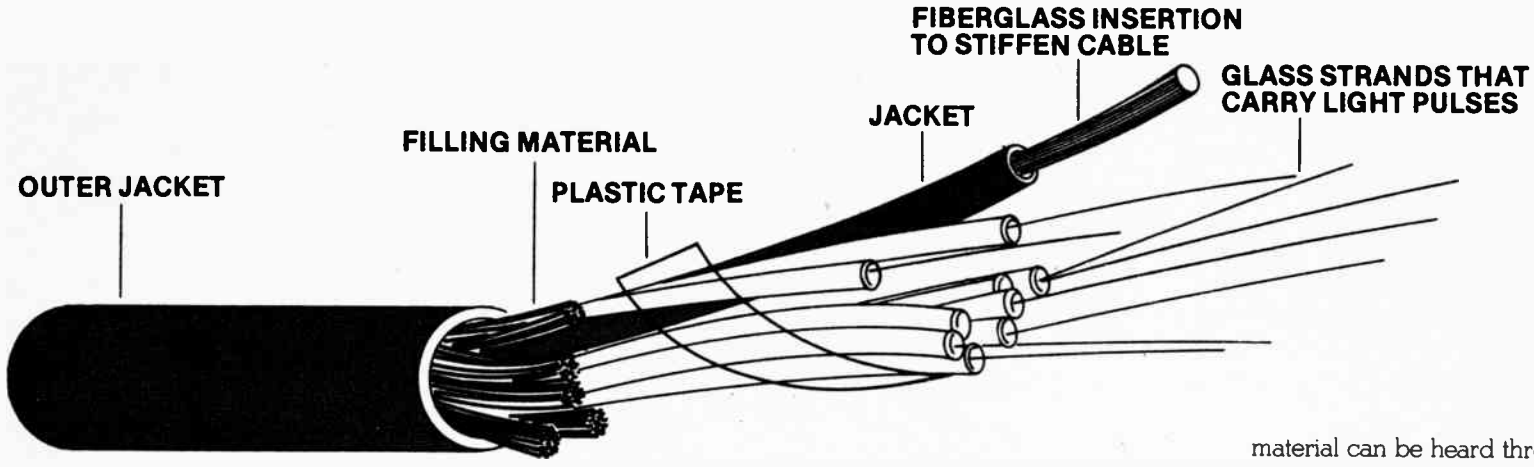
the Fiber Optic Connection



FIBER OPTICS CABLE

by Dr. Richie Moore

This is but the beginning of the fiber optic boom; a boom for media, and a great asset to those of us who want to hear what pure sound is really like. From one of the earth's most abundant materials, sand, will come a system that will shed new light on the aural dimension. In the near future the interfacing of the recording studio will resemble a web of glass.

The concept of fiber optics is a spinoff of space age technology. Fiber optics employs miniscule fibers of glass to transmit a series of infra-red light pulses. These fibers, making use of a new code of digitized information in large quantities, will be able to amply support the needs of high-fidelity music reproduction to mention but one area.

Many of us have seen the promise of fiber optics in ads for the telephone company. It is based on the discovery that glass strands thinner than a human hair are able to convey more simultaneous information than thicker copper wires, rendering all but obsolete the coaxial cable which has been the industry standard for as long as sound has been transmitted from one place to another.

The glass strands, thin as they are, can be manufactured to transmit light around even the tightest corners. Covered in highly sophisticated plastics, cables containing as many as ten strands can virtually be tied in knots and still preserve a continuous signal path.

Bell Telephone Labs in Holmdale, New Jersey, states that the technology has reached the point where a pair of fiber optic strands can transmit 672 different telephone conversations at one time. A cable carrying 144 fibers will be ½" in diameter and weigh about 6 pounds per 100 feet. This comes out to 48,384 individual transmission lines. Besides the minute size and giant capacity of the optic fiber, it brings to the audio field even more bountiful returns.

Fiber optics are ideal for complex control networks, such as audio consoles. Glass fiber is a dream come true for audio technicians. The fiber is not affected by any RF or other electrical interference, by short circuits, moisture, cold or heat. This coupled with the fact that it is capable of a frequency response that is totally flat from 0Hz to 450MHz is incredible news. Also, there is no insertion loss, and no impedance factors or inductance that copper wire usually possesses to degrade signal quality.

In a fiber optic system light pulses are fired in bursts, with energy consumption far less than that required to send a signal by electricity in copper. The pulses originate at the diaphragm of the microphone where acoustic energy is changed into electrical impulses. At this point, a device much like a small power supply containing a A/D (analogue-to-digital) converter and a laser light pulse device start the signal flow into the console, all information digitized.

At the console the digitized information from the microphones is routed to the various tracks on the digital recorder. TTL, or transistor-transistor logic, provides gain control over the entire energy spectrum. At the present time the only places where the D/A converter and laser emitter would be used is in the equalizer section, which can be totally bypassed, and on the monitor system so that the programming material can be heard through the speakers. Signal processing devices that are still analogue will need the digital to analogue and analogue to digital plus laser emitter on their respective inputs and outputs. At one point in the future all these outboard devices will be fiber optic as well.

Fiber optics is the ideal next step to work in conjunction with the digital recorders. In the digital system frequency patterns are added up and then coded into a number of bits and pulses. At the other end of the pulse code, they are decoded back into their original analogue form. All this happens so fast that it easily keeps up with complex waveforms found in music. This also presents very low distortion and no need for noise reduction systems.

Hewlett-Packard Corporation is hard at work with fiber optics, working on several systems designed for the communications media. Their first fiber optic system announced last September is a device they call a "link". The device transmits and receives 10 megabits of information per second over distances up to 100 meters. That's a billion "yes" (1) or "no" (0) signals that add up to a variety of more complex messages. As you can see, digitizing is inherently compatible with the fiber optic system, by which a tremendous number of bits or pulse "trains" can be sent down one fiber because they are each in their own wavelength.

The year 1978 will be remembered as the year that the recording industry first saw the promise of a working digital recording system. Now, in 1979, the promise is being fulfilled with the installation of the first commercial digital recording systems by the 3M Company.

Digital recording is designed to give us superior quality in our constant quest to capture sound at its best, the ultimate goal being reproducing what is produced.

Now, technology is giving us a tool by which we may be able to finally conquer some of the inherent problems at the other end of the recording chain, e.g., the console, microphones, and signal processing devices. The wonderful world of fiber optics has made its debut.

fact: the Pro Master™ sound system is not an evolution... it's a full-blown REVOLUTION!

The PRO MASTER modular sound system ushers in a new generation of sound system versatility, reliability, and quality for today's entertainers, musicians, and speakers — for use in settings as diverse as intimate clubs, lounges, large auditoriums, churches, and schools. Its multitude of performance-proven features is the result of sophisticated computer design techniques, advanced materials, and countless hours of personal consultation with performers and sound technicians.

Revolutionary New Console

Finally! The best of *both* worlds. A console so easy to use that it won't overwhelm the beginning group, yet with the advanced features and capabilities required by experienced professional performers — such as pre-fader monitor mixing, effects and/or built-in reverb, with their own tone controls, LED clipping indicators with attenuators on each input, and full patching facilities for every system component. Super power: *twin 200-watt solid-state power amplifiers!* Doubles as a stereo recording console for groups that want to "lay down a few tracks" without paying for studio time, or can be used as an ultra-sophisticated keyboard mixer with power. Unitized ARMO-DUR™ structural foam combination case and chassis makes it more durable than steel. Ultra-light: only 47 pounds.

Revolutionary New Loudspeaker

Every extra ounce — every unnecessary cubic inch — has been computer designed OUT of the PRO MASTER loudspeaker. Modern materials and molding techniques accommodate a high-performance 15-inch woofer and a high-frequency horn and compression driver in a startlingly small, efficient enclosure. Less than 28 inches high, 23 inches wide, 16 inches deep. Weighs an easy-to-handle 58 pounds. Yet, the power handling capacity is a remarkable 150 watts, and the frequency response is 50 to 15 kHz.

Revolutionary: Variable Dispersion Sound System

Advanced new variable dispersion high-frequency horn system projects your sound — everywhere in the house, giving you a choice of 60° long-throw, or 120° wide-angle dispersion with the twist of a knob. Tailors the sound to the room — even L-shaped rooms.

Revolutionary: FEEDBACK FINDER™/ Equalizer

Controls feedback — the number one enemy of a successful performance. FEEDBACK FINDER visually indicates the troublesome frequencies for precise adjustment of the twin 10-band equalizers. Enables you to equalize for maximum gain on the house and/or monitor system. Nothing else like it!

Revolutionary: PATCH BLOCK™ Patch Panel

The back panel is a unique combination block diagram and patch panel with 12 patching jacks located at appropriate points on the block diagram. For the beginner who is taking his act on the road for the first time, the PRO MASTER works "as is," with no special connections. But with the PATCH BLOCK, the professional can create a wide variety of setups and add auxiliary equipment without makeshift connections. And you can change setups at a moment's notice without confusion. Simplicity and versatility, the PRO MASTER has them both!

Revolutionary: LED Status Indicators

Alerts you to developing trouble *before* it gets serious! You have time to correct the problem before it interrupts the performance.

Replaces All This Equipment... And Does More!

The impressive array at left includes a mixing console, two graphic equalizers, a pair of 200-watt power amps, a monitor mixer and an octave analyzer. The PRO MASTER gives you all these capabilities — plus features that you can't find in any other console, at any price: Unique FEEDBACK FINDER™ circuit, exclusive PATCH BLOCK™ patch panel, wide-range LED peak output and input clipping indicators. Plus pre-fader monitor send controls, LED power amp overload, temperature warning and shutdown indicators, 0 to 30 dB input attenuators, full stereo features, simultaneous effects and reverb on each channel. What's more, you have Hi-Z *and* Lo-Z balanced transformer-coupled mic inputs on all six mic channels, (can handle 12 mics simultaneously), plus two additional auxiliary input channels for adding synthesizers, tape players, tuners, sub mixers or any other high level output components. And each Lo-Z input features built-in simplex powering for condenser microphones.

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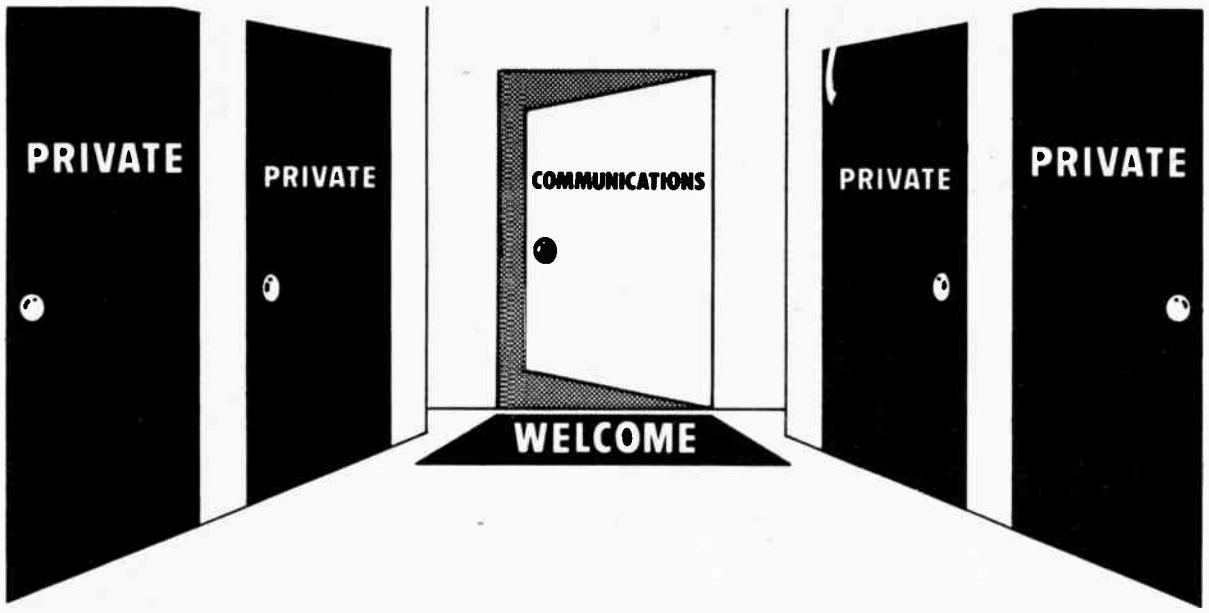


The Personal Touch

by Steve Krampf

Many times we can just get too close to our work to perceive its impact. The purpose of this writing is to open the dialogue between audio sellers and buyers in the hope that we can all better appreciate our efforts. As a seller I would like to see our customers better understand our motivations. It is our job, of course, to understand theirs.

Our Biz — Your Biz

The sub title Our Biz — Your Biz refers to the close relationship between our buyers and sellers. I know of no other business where so many sellers (manufacturers) reflect the ultimate customer within themselves.

In our biz, if you're having problems with the mixer that you just bought, chances are you can get in touch with its designer or the president of that company. In most cases, your problems will get a good listen and get taken care of. A year later at the AES Show, you may even discover that the ideas that you discussed have become reality. Now, if you don't like your Pinto, you may have a hard time getting a hold of Henry Ford. From the manufacturer's point of view, we'd sure like to thank y'all for that free consultation.

The motivation of most people in our Biz is to express themselves. Whether it comes from manufacturing a delay line to designing and building that "sweet sounding" room, the energy comes from the soul. The satisfaction comes from the fact that we can make a dream work.

The base of our industry consists of those dedicated customers who have scraped together every penny to start their studio. These folks have provided the support for this generation of musicians who are producing music that is better than ever.

To support these customers, a new breed of dealer has emerged who has made it easier for the customer to succeed. While there will always be the fast buck people, there are many contemporary dealers whose satisfaction comes from your satisfaction with them and their products. And for those people you should realize the fact that this is a low markup industry. Although the items we sell may involve a considerable amount of money — the relative profit margin is significantly less than that of the guy who sells you guitars, clothes, furniture, car maintenance, or tacos.

Money, of course, is important. In fact, it is that great big VU meter in the sky. And as our business grows, we must all get better at the money game.

Historically, all sides in an industry growing out of infancy are under-capitalized. Our industry has been no exception. Many customers, dealers and manufacturers can attest to that.

However, the fruits of the struggle are coming to bear. Our Biz is growing up and expanding. More people are becoming customers because more customers are making money at this business. So, Mr. or Mrs. Banker, color us a little greener because we're a good deal. If we seem a little unfamiliar to you in terms of our equipment, clients, and modus operandi, we shouldn't. If you look over your other shoulder, all we're talking about is Media.

Media

Media is our life line. Communicating the feelings and ideas of music, drama and life through records, radio and of course, the big one — King Television.

We all realize the change in reality this device has been responsible for over the last 30 years. This powerful tool has let us witness many events and productions that have enriched our lives. On the negative side, television has had its share of success in replacing some of our natural functions like thinking, reading and communicating.

Back to the positive side, video technology has opened up considerable options to our industry in the form of such novelties as video discs, $1000 color cameras and $1000 video recorders.

So, now if we want to mass-communicate, we can do it on a budget. We don't have to know someone in Hollywood or New York to produce a meaningful message from Minnesota. And to those of us who sneeze at $1,000 video equipment, remember what folks said about ½" 8-track.

Now before I get prosecuted for evangelism, let's slide over to our next topic.

Education and Edification

Bullshit can reach epidemic proportions in our Biz also. We've got our share of charlatans and lousy products. We can periodically read some pretty good science fiction in the pages of our print media. I'm going to cop out on specifics here, for that you'll have to wait for my memoirs (which I plan to publish before I die).

I vigorously support efforts to make equipment better and feel that those of us involved in recording and production should rededicate ourselves to getting better and learning more about our craft. Consider our record collections. There is some music that sounds just great because it is recorded well. The poorly recorded music can be traced to poor mastering or disc quality but in too many cases has resulted from a poor master tape.

In traveling the country and listening to quite a few master tapes, I have found that over-recording is running rampant in some parts of our industry. So, watch your levels, follow your dynamics, listen for phase distortion but keep on cranking it out.

Make Your Own

I'm glad that those of you who thought our Biz was perfect are now somewhat relieved. We may not be the answer to the woes of capitalism but I feel that we're making better progress than most Fortune 500 companies.

Let me leave you with something that Scoop Nisker would say: "If you don't like your tape machine, go out and make one of your own". Because that's what Our Biz — Your Biz is about.

Steve Krampf manages national sales for Otari Corporation where his responsibilities also include product development and advertising programs. Previously Steve served as Vice President of Express Sound in Costa Mesa, California; was responsible for opening up the Northern California market for Tascam; and has engineered at several 16 and 24 track studios.

DRUM DRUM DRUM DRUM DRUM DRUM

MIKING Part 1

by David Teegarden

The drum is an ancient kind of instrument — basic, simple and unfortunately very difficult to record. Since the dawn of recording studio time, drum resonances and acoustical factors have plagued many a recording engineer.

As a drummer and producer, my priorities lead me to look for a 'hip' drum sound. A 'hip' sound to me means a good fat snare drum and a nice solid kick with a little bit of high hat for the top end. The 'hip' sound really changes depending on the mood and feel of the song. Some songs require a nasty or funky sound while others may need a very clean and dry sound. Actually, some of the funkier things I've heard used a clean dry sound. My overall preference is for the dry sound when I record my basic tracks. I also prefer an acoustically dead environment when I'm playing so I can hear my kit rather than the room.

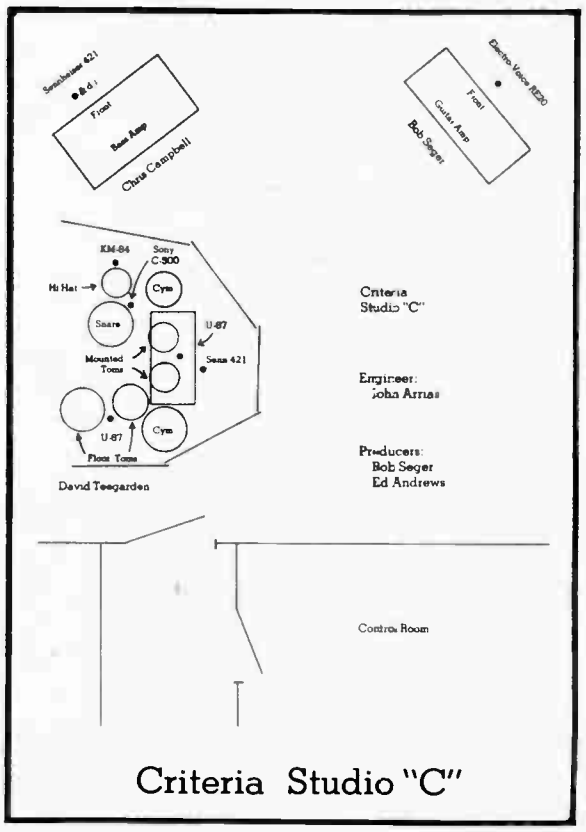
When I play with Bob Seger I will generally use the same Rogers kit on stage and in the studio. It's a small set in comparison with some of the sets that many other major acts use — 22" bass drums, mounted toms of 13" and 14", and 16" and 18" floor toms. I've been using hydraulic heads for both stage and studio. These are two ply heads with a film of oil in between to dampen the ring of the drum and make miking a little easier.

I recently played on a couple of Seger's tunes at Criteria, in Miami, with Bob on guitar and Chris Campbell on bass. John Areas did the engineering. John did Bob's "Stranger in Town" album and is a fine engineer. We used a Sennheiser 421 on the bass drum, a Neumann U-87 on the mounted toms about 6" above and another U-87 about 6" above the two floor toms, both in a cardioid pattern. The 87's provided an excellent balance of the toms with a minimum amount of miking. They also did a good job of picking up the ride and crash cymbals. We used a KM-84 directly above the high hat pointed straight down to the cymbal. On the snare drum we used a Sony C-500 just off to the side. That mike gave us a good crisp snare sound. Studio C at Criteria has a high ceiling and we used an ambience mike about 20' above and in front of the drum kit. It supplied a nice top end to the overall sound of the kit. The studio is pretty dead acoustically and we found that in listening back to the tracks, if we took out the room mikes, the kit sounded too dry and lifeless.

We're going back into Criteria soon to cut some more Seger tunes and I plan to take off the hydraulic heads and use the more conventional Ambassador heads, just to get a little different sound. I get a pretty incredible drum sound, or at least it seems that way to us. But we don't like to use that sound all the time — we can't be too consistent. The great drum sounds aren't always right for a particular song.

In my 8-track studio at home, we've deadened the hell out of everything to soak up all the stray sounds and we have managed to get a very unique kind of drum sound. Much of that unique sound is a result of laborious microphone technique. We use a couple of Neumann's, a Sennheiser, and some of my favorite old E-V RE-20's. Those RE-20's are real workhorses and can really take the punch that a bass drum delivers. The RE-20 also seems to work well on the snare, although it's kind of bulky and I had to learn to play around it.

Cont'd on page 24....



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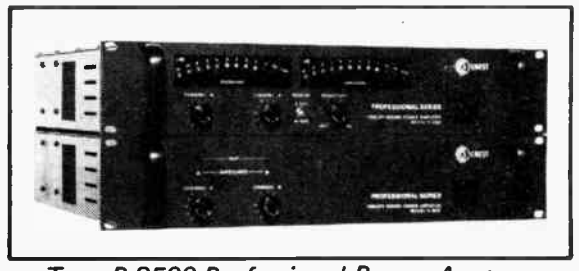

Top: P-3500 Professional Power Amp
Bottom: P-3501 Professional Power Amp

Fifth, a whole range of very impressive features. Such as the high SOA (safe operating area) – no limiting circuitry required. Such as the built-in circuit-breaker protection for each channel—no fuses needed. Such as the XLR input connectors and ¼ inch phone jack (active balanced or unbalanced) – no external transformers required. Such as the totally modular construction—readily accessible for easy servicing. Such as the rugged steel construction—with all components and modules securely sandwiched for added strength.

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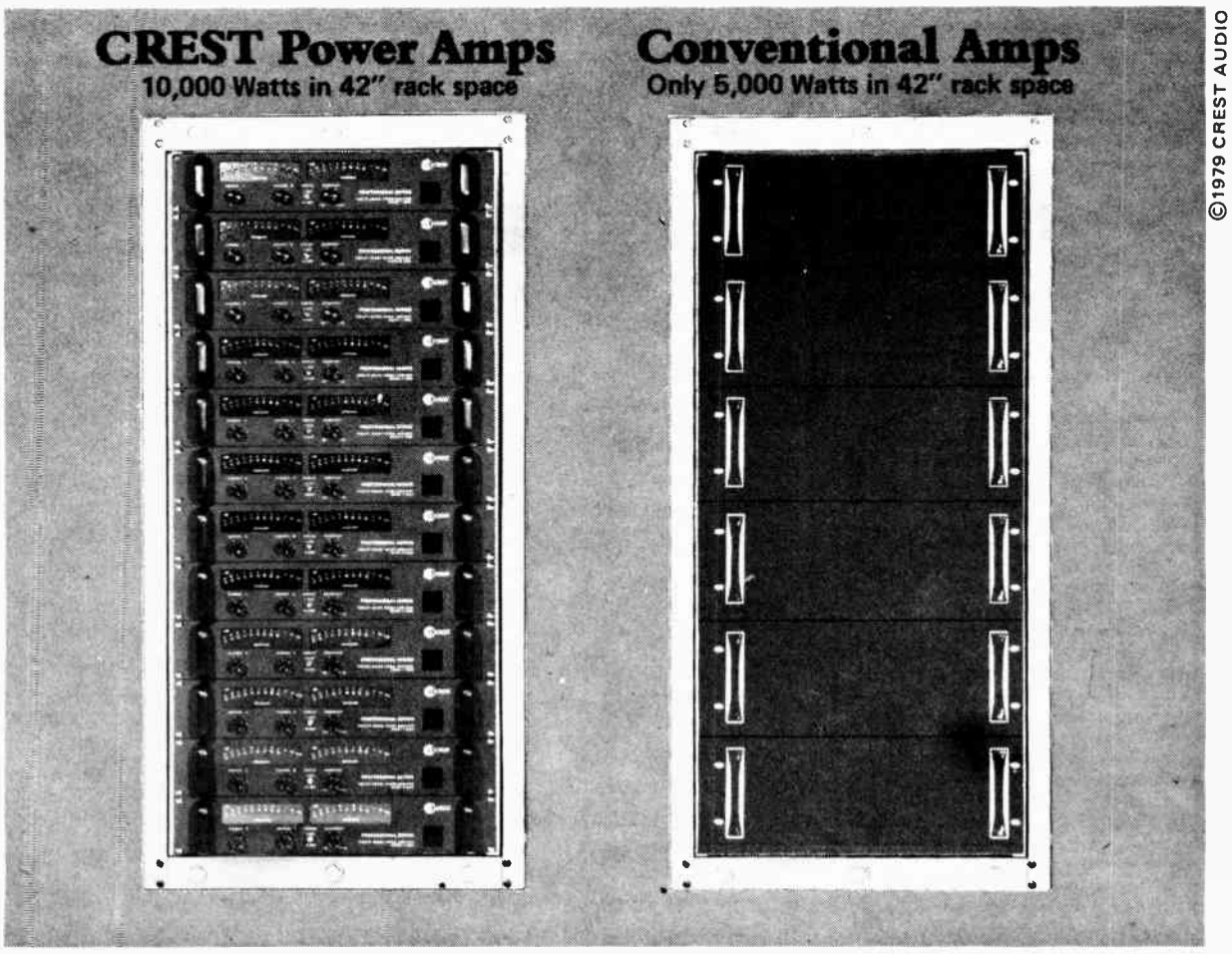

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Cont'd from page 22

we'll show you ours, if you'll show us yours!

The Mix is interested in finding out who our readers are. We'd appreciate it if you would fill out the form below and return it to us so we can learn more about you and what you like. To show our appreciation, we will send you a free copy of The Mix Northwest Studio Directory. Thanks for your time.

1. What is your age?
   ☐15-25 ☐25-34 ☐35-40 ☐over 50.
2. Are you ☐male or ☐female?
3. What is your occupation?
   A. RECORDING STUDIO
   ☐Owner
   ☐Engineer
   ☐Staff
   ☐Independent
   ☐Maintenance
   ☐Producer
   ☐Independent
   ☐Staff
   ☐Studio Employee
   B. MUSICIAN
   ☐Full Time
   ☐Part Time
   ☐On contract to record label
   C. PROFESSIONAL AUDIO
   ☐Manufacturer
   ☐Dealer
   ☐Store Owner
   ☐Employee
   ☐Manufacturers Rep.
   ☐Designer
   ☐Consultant
   D. MISCELLANEOUS
   ☐Radio/TV
   ☐Student
   ☐Other (please specify)
4. How long have you been involved in recording?
   _____
5. How much time do you spend in recording studios in one month? _____
6. What other recording related publications do you read? _____
   _____
   _____
7. Do you have recording equipment in your home?
   _____
   ☐professional ☐reel to reel ☐cassette
8. Where did you get your copy of The Mix?
   _____
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9. What other listings, features or articles would you like to see in future editions of The Mix?
   _____
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(2) dbx 160 Comp/lim
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Eventide Harmonizer
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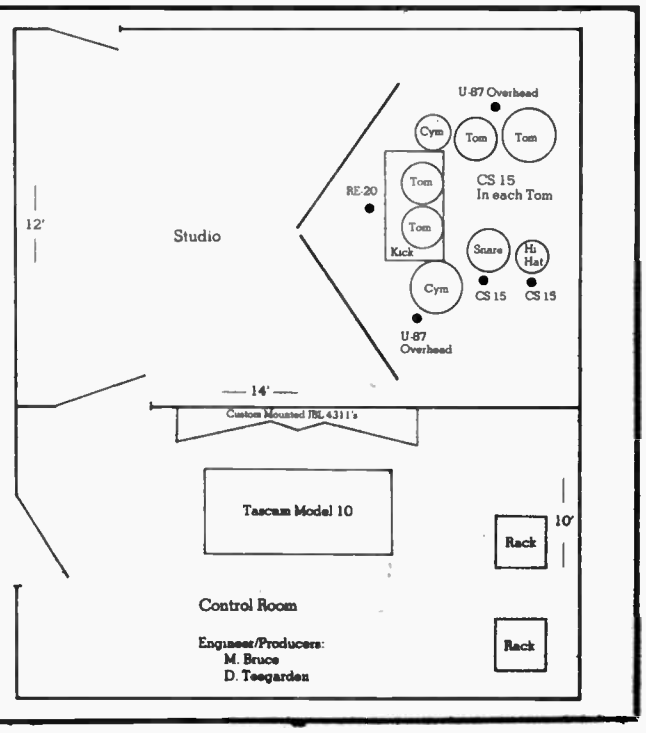
Tapco 4400 Reverb
104 pt. Patchbay
EXR Exciter
Altec 63-A Eq.
Revox A-77
TEAC 3340
JVC KD-85 Cassette



We have also started to use Electro-Voice's new CS Series of electret condensers. They use an outboard power supply and there is a slave attachment to the power supply to handle a total of six mikes from one power source. The CS mikes have a nice top end and we use them for overheads and snare as well as for many other instruments in the studio. One of my favorite techniques is to put the CS mike inside the tom, about 3" or 4" from the head and off center to get away from that null point. This gives me a good balance between the attack and the tone of the drum.

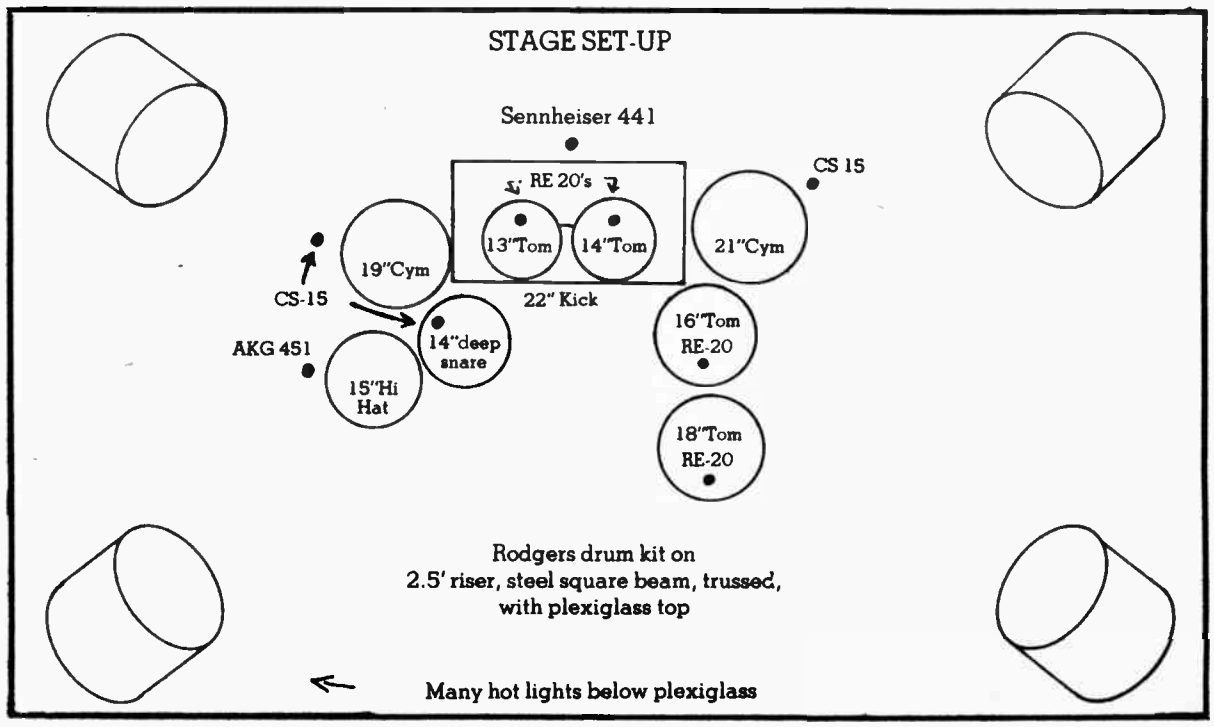
The drums I use in the studio are a little bit smaller than the ones I use with Seger. The bass drum is the same but the mounted toms are 12" and 13" and the floors are 14" and 16". I use the same chrome snare made by Pearl. All the lower heads are removed from the drums, both in the studio and on the road.

Getting that fat solid sound I mentioned earlier doesn't necessarily mean that I need to use the most expensive mikes. I've gotten these sounds with two or three Shure SM 57's. Another technique that has given me some of my best sounds has been to electronically pad the microphones quite heavily to give a better separation between each drum. That sometimes requires forceful playing and I find myself attacking that drum set pretty heavily.

You do need time and patience, though, to get the sound that you are looking for. Mike Bruce, my partner at the studio and an excellent guitar player who has spent years working with Bobby Bland and Seger, helps me get the sound. It really takes two people and a lot of care and patience to get the drums the way I like them. It's time consuming and placement is critical and it doesn't help to do this job quickly. By the same token, it doesn't help to spend so much time that you burn yourself out.

I know many heads have been scratched over obtaining the proper drum sound. What might have seemed like an impossible task has often turned out to be a very rewarding experience and possibly even sold millions of records. But, once again, patience and persistence are the key techniques of getting a good drum sound.

Born and raised in Tulsa, Oklahoma, David Teegarden has spent the last two years drumming for Bob Seger and The Silver Bullet Band, both on stage and in the studio. David has also recorded with Leon Russell, J.J. Cale, Joe Walsh and Teegarden and VanWinkle. Between gigs David operates an 8-track studio and production facility in the foothills of North Tulsa.



sound advice

On Compressors and Limiters

by Dr. Richie Moore

Dear Dr. Moore,

I am baffled by what makes for good compressors and limiters. There are so many that seem to have different features, and still some people have their favorites. I suspect that this is because they favor the types that they learned on or that they have had the most experience operating. As my experience with limiters and compressors has been very limited, I would like to know what you have to say about this particular gear — the pros and cons of the available units.

Bill Whittens,
Van Nuys, California

Dear Bill,

Limiters and compressors are about the most widely-used form of outboard signal-processing equipment on the market. There is probably not a studio or sound reinforcement company that does not have at least one, and, in most cases, quite a few, limiters or compressors available to them.

What makes a compressor or limiter good is not necessarily the unit itself. The knowledge of when and how to use the unit is often the determining factor in its success. Due to the limited amount of dynamic range that the tape can accept, it is necessary for the mixer to control his levels by riding the fader, or by installing the limiter or compressor in the signal chain. In reality, these devices are nothing more than automated fader controls. Unfortunately, many people in the recording, broadcasting, and film industries really have little intimate knowledge of limiters and compressors.

You are quite correct in your assumption that people have their favorites, and that is usually because the equipment is that on which they have learned or to which they've had the most exposure. This is somewhat unfortunate because a specific limiter/compressor, which might be a better tool for certain situations, could be overlooked because of a certain operator's prejudice.

Most engineers play the instrument by ear. This, in itself, is not bad. However, many engineers tweak all the knobs and push all the switches until they have something that approximates the sound or level control that they desire. Those engineers that have a true knowledge of the operation of the limiter/compressor can attain great results very quickly.

In a recent survey conducted by Studio Sound, the English version of our Recording Engineer/Producer, there were more than 73 varieties of compressors and limiters on the market. Each of these offered something slightly different in design and operation. Since the limiter/compressor is a kind of black box to most operators, I will try to shed some light on the units and what to look for in their operation.

The usual purpose for the use of limiting and compression is either to increase apparent loudness or to provide overload protection and control level.

Limiting implies the use of a level control device to provide overload protection — its purpose is to 'limit' the signal level at some specified point. Controlling transients (peaks of short duration) that exceed the pre-determined peak recording level is the limiter's major concern. This control does not markedly affect the dynamic range of the input signal, since the limiters action is momentary and of a low order or magnitude. Such action allows the operator to reduce his system's headroom and to operate with a higher level of recording, without fear of overloading. The dynamic range is thus increased.

Compression is used to describe conditions of gain reduction that are more or less continuous; thus the original dynamics are compressed. The compresssion ratios for this are usually 2:1 or 4:1, depending on the required effect. Compression ratio also is considered the slope of the unit. In other words, a 2:1 compression ratio would allow every 2 dB increase in signal gain to have a 1 dB rise in output amplitude.

Attack and release time are very important to compression, since they determine the moment-to-moment gain change in the system. It is this rate of gain change that determines loudness. (The attack time is usually set by the threshold; an understanding of instruments and their harmonics will dictate the proper release and attack times for a given instrument.) The faster the release and the lower the slope, the more low-level signal will be brought up to peak level. One problem that frequently arises from improper recovery-time adjustment is "pumping," or "breathing." Another common problem — because a very fast release time flattens the low-frequency waveforms — is low-frequency distortion.

Some limiters and compressors now have built-in noise gates. Others offer frequency selection to accentuate certain parts of the signal. There are a variety of other options from which to choose.

The applications to which limiters and compressors can be put are extremely diverse; but any tools with such potential usefulness can be abused. My advice on this topic can be easily summed up: "If you don't need to use a limiter or compressor, don't use one; but if you're convinced that one of these units can help in a given situation, then use it with grace and taste."

For answers to your audio and recording questions

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progressions

Facts About Digital in the AUDIO WORLD

by Larry Blakely

In the past several months there has been a lot of talk and excitement in the professional recording industry regarding digital audio tape recording. Without question, digital audio will alter the entire recording industry over a period of time. But the important questions are, "what is this period of time?" and "how will digital technology effect both the large and small studio owners in the near future and over the long term?" The answers to these questions are not simple.

Today there is a lot of talk regarding digital tape recorders, digital recording consoles and even newer types of digital processing devices on the horizon. The area of greatest concern, the one to which the greatest amount of attention should be given at this time, is digital audio tape recording. What are the advantages of digital tape recording over conventional analog tape recording? For what types of recording will digital be best suited? Who is going to be able to afford digital tape recorders? What will be the effect on studios who do not have digital tape recorders? What about standardization of digital tape recording formats and does it really matter? How long will it actually be before all the dust has settled and digital audio tape recorders are a real factor in the professional recording industry? These are important questions to most everyone in our industry.

The balance of this article will be devoted to shedding some light on these questions. The information contained in this article is based upon my own personal knowledge and experience. It is my purpose to provide some clarification to those in our industry who might be wondering, "what the heck is going on?"

WHAT ARE THE MAIN ADVANTAGES OF DIGITAL TAPE RECORDING OVER CONVENTIONAL ANALOG TAPE RECORDING?

Digital tape recorders will provide a signal-to-noise ratio of approximately 95dB, which is some 25 to 30 dB better than analog tape recorders, without the use of any type of tape noise reduction system. The digital claim of 95 dB signal to noise means no audible background noise (tape hiss) whatsoever. The dynamic range capability of digital tape recorders is some 95dB as compared with 60 to 70 dB offered by analog tape recorders. Extended frequency response is another plus of digital recorders, with some claiming flat frequency response from 1 Hz to 23 KHz. Digital recorders have much less tape modulation noise than analog recorders, greatly reducing or eliminating hiss and noise envelopes. One of the strongest advantages of digital tape recorders is that there is no noise build up when making copies (tape generations) or ping pong of tape tracks. Analog tape recording will cause an increase of background noise (tape hiss) of approximately 3 dB every time a tape copy is made or a track is ping ponged. In theory an infinite number of tape generations (copies or ping pong) can be made on a digital tape recorder with no audible noise build up.

Digital tape recorders will also allow more tape tracks to be placed on a narrower width of tape. Some digital tape recorders will have 32 tracks on a one-inch wide tape. But if you are looking for a saving in tape cost, also realize that, while the width will decrease, the length will increase by a substantial amount. Some digital tape recorders have a tape speed of 45 ips (inches per second) as compared to speeds of 15 ips and 30 ips used with analog recorders.

Electronic editing is one of the "fun gadgets" that can come with digital tape recorders. This device will allow punch in, punch out, and editing to be done with great precision. This new electronic editing process is three giant steps forward from our conventional punch in, punch out, and editing methods.

It all sounds pretty incredible doesn't it! But what about the audible and sonic qualities of digital tape recording? Is digital audio technology good enough for your purposes at this time or not? It will be up to each of us to listen for ourselves and make that all important judgement. You might refer back to March's column which pointed out some things to be considered in making a truly subjective and accurate evaluation between digital and analog tape recorders.

FOR WHAT TYPES OF RECORDING IS DIGITAL BEST SUITED?

I have had the opportunity to listen to a number of digital master tapes. These tapes captured the full dynamic range of the music (up to 95 dB) and the full audible frequency response (0Hz to 23 KHz). The quality of this recorded music from these master tapes was outstanding and I found this listening session to be an eye opening as well as an ear opening experience.

Audiophile discs — Today there are a number of digital tape recordings that have been transferred to high quality phonograph records that are called "audiophile discs". A number of these digital tape to disc audiophile recordings are on the market today. Some of these digital to disc recordings sound pretty impressive. However even such a high quality type of record pressing is only capable of some 65 dB dynamic range at best. This means that the listener cannot realize the full dynamic content of the digital tape recording (up to 95 dB) on a high quality record pressing. The dynamic range is still restricted by the phonograph record, and that old demon "surface noise" still covers some of the fine qualities offered by the digital tape recordings. The full potential of such digital recordings cannot be realized by the consumer for home music listening until a new type of high quality playback medium is developed to replace the conventional phonograph record. This new playback medium should provide near 95 dB of dynamic range with no unwanted noise or undesirable audible side effects.

Even with the constraints of the conventional phonograph record these digital to disc recordings can provide a better audio quality than can the normal analog tape to disc type phonograph records.

What about rock and roll? — It is very important to keep in mind that most conventional "pop" record albums are designed with very little dynamic range. To make these "pop" records sound loud, the dynamics are drastically reduced in the studio by compression and limiting, with additional compression and limiting done at the disc mastering stage and yet additional compression and limiting done by the radio broadcast stations. The name of the game is to squeeze the dynamics and make the records sound as loud as possible.

The point here is that wide or full dynamic range is not necessarily desirable for the "pop" record product. The advantage of the digital wide dynamic range for the producers of "pop" record product is the absence of audible noise and the lack of noise build-up when making copies or ping pongs!

The extended frequency response of digital recording will also not likely be a plus for "pop" records. In order to cut loud records and also obtain the greatest amount of playing time, the disc mastering process will typically restrict the extreme high and low frequency response, often times 30 Hz to 15 KHz or sometimes even 50 Hz to 10 or 12 KHz.

Digital tape recording does offer real advantages for the "pop" recording studio desiring a large number of available tracks. The ability to do infinite numbers of ping pong and tape generations (copies) without audible noise buildup, no audible background noise (tape hiss), precision and accuracy in punch-in, punch-out and editing, as well as an increase in audible and sonic recording quality can be achieved by digital tape recording in the opinion of many.

WHAT ABOUT STANDARDIZATION?

The professional recording industry has enjoyed the use of standardized tape recording formats. This standardization allows the artists to record some portions of their master tape at one studio, and then take their tape to other studios to record yet additional tracks or to do mix downs. If you have a 24-track tape, most of the 24-track machines throughout the world will play or record on that tape. The same is true for 4-track, 8-track, and 16-track. The professional recording industry has become accustomed to the interchangability of master tapes from one studio to another.

At this time two manufacturers are showing digital tape recorders that are incompatible with each other, with the possibility of another manufacturer introducing a third non-compatible machine. An attempt was made to establish a standard format by the AES and the manufacturers, however, because of possible anti-trust actions, the AES standards committee was abolished.

Some manufacturers say that it is too early to establish a format, because the digital technology is too new. Many of the large studios in Los Angeles who purchased

Cont'd on page 30...

Sound Off

Sound Off provides a stage for declarations of product design, philosophy, and direction. The opinions expressed in Sound Off are those of the author and do not necessarily reflect those of Mix Publications. If you are interested in "sounding off", let us know.

CAMEO enters STAGE II

by Ken Sachs

A major thrust forward was the agenda for a recent Board of Directors meeting of CAMEO (Creative Audio and Music Electronics Organization). This important directors meeting took place in Chicago on April 4, 1979. According to David Shulman, a Chicago attorney and Executive Director for CAMEO for the past ten months, "We had determined in the beginning that CAMEO would be launched on a grass-roots basis."

Many important accomplishments have been made to date. CAMEO has formed a cohesive body of member/manufacturers, 32 in number, which proves the need for the existence of CAMEO to aid members in the development and growth of this rapidly expanding creative audio and music electronics market.

During the ten months of CAMEO's existence, the organization's by-laws have been written and approved, a non-profit corporation was established, and delegate committees were appointed.

Six Board of Director's meetings have been held at regular intervals in which the member/companies have generated many innovative ideas for the needs and the growth of this new market. Additionally, CAMEO has begun to generate closer relationships with the other trade organizations in the industry by conducting panel discussions at the recent CES and NAMM trade shows held earlier this year.

To assist the organization during this formative period, David Shulman volunteered his efforts as executive director, his office as temporary headquarters, and his staff.

In the recent Board of Director's meeting, it was determined that the operation of CAMEO on a part-time basis was no longer feasible for the organization to achieve its objectives. The Board voted unanimously that it was now time for CAMEO to establish its own office, appoint a full-time executive director and to operate the organization administratively on a full-time basis.

After examining a number of alternatives for CAMEO's full-time operation, it was decided that Ken Sachs, recently of TEAC/Tascam division would be ideal for the position of full-time executive director. Mr. Sachs has officially accepted this position. The Board of Directors and the entire membership expressed their gratitude to Mr. Shulman for his indispensible assistance to CAMEO to date. Mr. Shulman will continue to serve as legal counsel and advisor to the Board of Directors of CAMEO.

Mr. Sachs resigned his office as President of CAMEO in order to assume this new position. Larry Blakely, Vice President of CAMEO, will assume the position of President-elect until the next election which will be held at the annual general membership meeting in Atlanta, Georgia this June.

Executive Director Ken Sachs announced that CAMEO's headquarters will be moved from Chicago to its new location at 5430 Los Angeles Ave., Simi Valley, California 93063.

According to Mr. Sachs, "The foundations have been laid throughout Phase I and now CAMEO will move into Phase II, and year two, which promises to be one of visibility and action."

The first of CAMEO's new programs will be a series of twelve educational seminars for sales personnel, owners, and managers of retail outlets at the upcoming NAMM convention in Atlanta, June 9-12. Additional programs are to be announced after they are finalized at the next CAMEO Board of Director's meeting on May 14, 1979, at the Biltmore Hotel in Los Angeles.

President-elect Larry Blakely said, "The Board of Directors has determined that it was indeed time for the Phase II full-time effort and CAMEO has now truly come of age."

Cont'd from page 28

the first 8 track, 16 track, and 24 track tape machines have told me that they will not purchase digital tape recorders until there is a standard established. This attitude of large studio owners could be a large stumbling block for digital tape recording.

Without question a standard digital format must be established before digital tape recording can reach or even begin to approach its full potential in the professional recording industry. This can only be done by another standards committee or else the digital tape recorder manufacturers will slug it out in the market-place until the industry chooses the digital format they prefer. If it is up to the industry to choose between the several digital machines in the market-place, this could greatly increase the time that it takes for digital audio tape recording to become a major factor in the recording industry.

WHO CAN AFFORD DIGITAL TAPE RECORDERS?

When any new type of technology is introduced it usually comes at a great deal of research and development expense to the manufacturer. What does this mean? Initial units involving new technology are expensive. As time goes on and more people purchase the units, the prices usually go down. The first digital tape recorders are going to be very expensive and will remain so for some period of time. Initially only the larger studios will have the budget to purchase such machines. But, as mentioned earlier, the lack of standardization may slow this down substantially. Without question digital tape recording will be a very expensive proposition for the near future.

WHAT WILL BE THE EFFECT ON STUDIOS WHO DO NOT HAVE DIGITAL TAPE RECORDERS?

As mentioned earlier the main advantages of digital for "pop" recording will be the lack of audible noise. In the opinion of many there will be a marked increase in the quality of recorded sound. When any new technology is introduced there are always those who run to those studios to play with the new "toys". This was true with the advent of 16 and 24-track recorders and the same will probably happen with digital.

In the case of "pop" recording, many feel that they can still make excellent sounding product with analog tape recorders, with or without tape noise reduction systems. Those who do not have digital tape recorders may have to work a little harder, to produce better sounding product with what they have.

HOW LONG WILL IT BE BEFORE THE DUST HAS SETTLED AND DIGITAL TAPE RECORDERS ARE A REAL FACTOR IN THE RECORDING INDUSTRY?

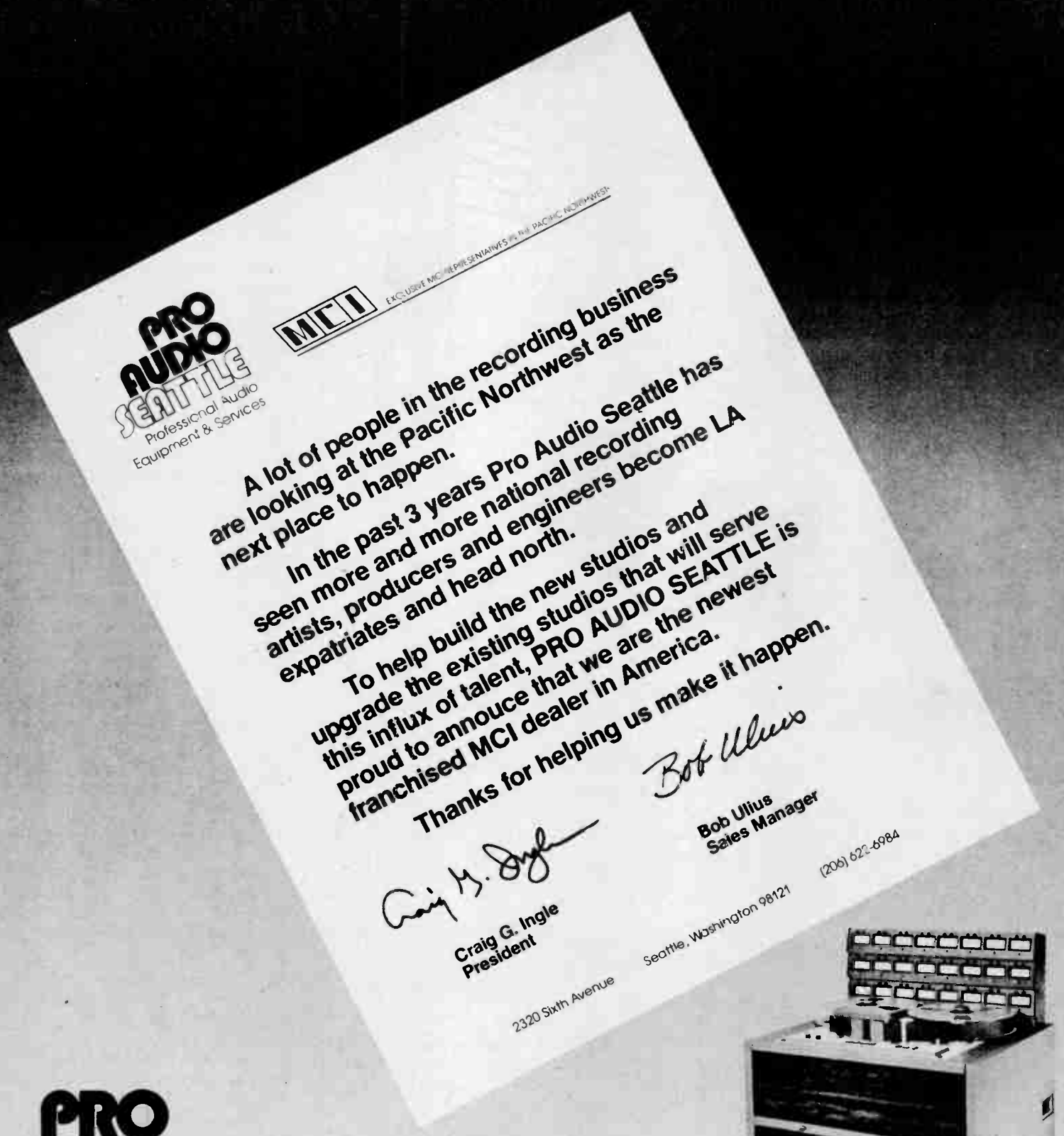
This is a question to which no one has the answers. However I can tell you that it will be a darn sight longer than many people think. No industry can adjust to a radical change overnight.

Some people think that in one or two years there will not be any analog recorders in use. I can assure you that this is not so. Digital recording is a major change for the recording industry and expense and lack of standardization will pose resistance to digital's course. In my opinion digital will change the entire face of the professional recording industry. This will take time! We have only seen the tip of the iceberg with the advent of the digital tape recorder. Digital recording consoles and complete digital recording systems are yet to come. All of this is going to take time and it will not happen over night.

Analog tape recorders will still be around for a long time. The advent of digital tape recorders may provide the incentive for analog engineers to find a better way to build analog tape recorders or invent some means to increase the quality of existing analog tape recorders in the future. It has been my purpose to shed some light on this digital controversy by looking at the situation in a broader scope. It will be necessary to keep our ears to the ground, watch the trends as they change, and evaluate our position on a continuing basis. If we do this we need fear no surprise attacks from the Indians.

THANKS HOLLYWOOD

(Nashville, New York and San Francisco)
For Hanging in There Until SEATTLE Was Ready to Happen



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DISCO LAND

by Mr. Bonzai

Mr. Bonzai is currently writing a TV Movie based on Discoland as well as a screenplay — "Ear Witness," a comedy-mystery dealing with recording studios.

Last week my 400 shares of Hindu Pharmaceutical dropped to 1⅜. My stock in Buddhist Bicycles ran off the bottom of my classy wall chart, and my interest in Hare Krishna Health Foods got the interest of the Yeahman government. Riding the waves of international economics can make ya feel like a real hodaddy.

My mother suggested I needed to "get out and boogie at the disco." Not many mothers are qualified to give such advice, but my mother is the owner of "Mazy's". Mazy's is the chain of international private discoteques, so I considered her advice. The Mazy's empire has just purchased a 40-story highrise in Manhattan and christened it "Discoland". The new disco-complex promises to satisfy every conceivable human need.... all with a disco flare. I decided a visit to Discoland would be the best possible way to really "get out and boogie".

Before I hopped a plane to New York I decided to do a little research into the history and psychology of disco. Most authorities trace the essence of disco back to Native American Indian dance ceremonies. I spoke with Professor Wildfrid Byrd-Bearde of the Pepsodent Institute of Dance and Culture. The Professor summed up the craze:

"We are talking about a way of life, not a craze. The disco phenomenon, the disco philosophy, the disco psyche is forming now and will be with us for hundreds of years. Society has reached its most crowded point. To live together, mankind has learned to withstand a bump or two from one another. We have learned to touch a bit... but not too much. The self-protective psychological mechanism of the human being says to back off if we get too close. This is the ethic of disco. Hustle but don't hassle. Get close, get warm, get it on, then move on. For good or for bad, the disco way is now the world's most popular religion."

Equipped with this knowledge of the inner workings of the disco mentality, I headed for New York and the billion-dollar adult amusement center: Discoland.

After a routine security check by Discoland Security, I was whisked aboard one of the many golf carts that carry fun-seekers from pavilion to pavilion. My first stop was a visit to the educational centers. Not only are the latest dances taught, but visiting lecturers expound on the philosophy and psychology of disco. Like any other classroom, the only difference was the ever-present disco sound. Everywhere I went I was followed by disco music. Even the lecturers had disco background music as they casually "boogied" through their lectures.

After passing through a few disco encounter seminars focusing on disco motivational therapy we proceeded to the Disco Cinema Pavilion. Here we viewed favorite old movies with new disco soundtracks. A copy of James Cagney in "Public Enemy" played with a new version of the "Theme from Shaft" while the second feature, a Busby Berkeley musical was shown with new "Saturday Night Fever" adaptations. To see those hundreds of girls from the thirties swaying to the beat of the Bee Gees was an awesome sight.

Next stop was the Disco Marathon where dancers boogied for top prizes by merely staying on their feet and dancing. Some had been at it for weeks, yet seemed amazingly fresh. Having learned to eat, drink, sleep, etc. while still dancing, they appeared like an entirely happy race of futuristic automatons. In a special clinic next to the Disco Marathon, dancers lined up to meet Clyde Schubacker, famed disco chiropractor. Dr. Schubacker treats disco-related injuries and diseases. Even the doctor's offices were filled with disco music. In this case, it was a disco version of the Ben Casey theme that motivated the buxom nurses in this modern healing pantheon.

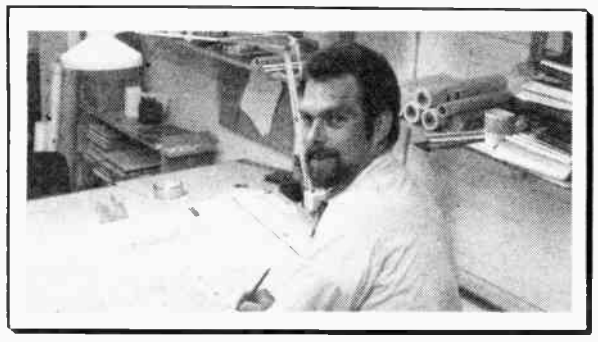
We passed quickly by the Disco Bath & Grill where every possible social or sexual preference can be found. The only rule is: "Come Alone, Leave Alone." Next we visited the Disco Fashion Boutique on the 38th floor and viewed the new "Spring Lizard and Chain Collection." The 39th floor offered the Disco Fun Zone. Here dancers stepped into motorized shoes and were "danced" thru the "Tunnel of Grooves." In this attraction, members found themselves rapidly shifting from slow dance numbers to automatic dancing faster than humanly possible. In a matter of minutes, guests were given a taste of every major disco hit from the past decade.

After a quick drink on the 40th floor at "The High and the Mighty" Lounge, we took the express elevator to the underground control center of Discoland. Here we visited the music factory which pumped fresh disco music throughout the building. Sitting at the computerized mixing console was Dr. Chas. Castle, music professor and full-blooded Cherokee. It was Dr. Castle who programmed the entire operation with a savage flare. His explanation of disco was profound.

"Disco means uniformity with a dash of eccentricity. Here I construct instant disco music from the basics of synthesizer kick-drum, fuzz bass, and 'raunch' guitar. Next I add the incidental percussion, the mellotron strings, the wailing background vocals, and we have almost everything for a hit disco record. All that remains is the final bizarre touch. In this case, I go to my catalogue of tapes and add the sound of killer bees being fed into a trash compactor. Incredible the way they add a touch of desperation and wild ambience!"

I left the Doctor of Disco to his mixing and mused on this theory of disco music. It seemed to me that the rules of disco music fit the categories of disco fashion and disco psychology. The object of the successful disco devotee is to "fit perfectly, but be yourself." The fashions demand totally current trend awareness. The cuff of the pants must be a certain width. The height of the heel must be exact. The width of the collar and the fabric are strictly regulated. But after all the requirements have been made, the individual must provide that one glimpse of the true self. It might be the wallet worn on the belt inside-out, or it might be a small frying pan worn as a hat. If others stare, you have gone too far. If they wink, you've made the grade.

As I climbed aboard one of the golf carts and whizzed down the hallways of Discoland I realized I had a long way to go.



ARCHITECTURAL ACOUSTICS

for small studios

by Dennis Paoletti, A.I.A.

Dennis Paoletti is a senior partner of Paoletti/Lewitz/Associates Inc, acoustical consultants, in San Francisco, specializing in recording studios, listening rooms, performing arts facilities and electro-acoustic sound system design. A Registered Architect of the State of California, Dennis has been an acoustical consultant for 12 years, serving as Associate Manager of Architectural Acoustics for Bolt Beranek and Newman for eight years.

The continued growth of the music industry in general has led to a substantial increase in the number of small recording studios constructed throughout the country. Architectural and acoustical design aspects should be thoroughly considered for studios and control rooms of all sizes. Often, developers of small studios do not have the experience or knowledge to properly execute the total design package.

Frequently these studio facilities are of the relatively low-budget type. They often make use of existing structures such as residences (modifying an existing space — e.g., family room, excavated basement, garage, etc. — or building an addition), or small commercial spaces (in shopping centers or office complexes). As you may begin to realize, there are a considerable number of problems associated with the construction of a small studio with a limited budget in an existing building. However, there can also be a great deal of excitement and gratification in bringing these types of projects to realization. Inherent limitations in budget and space frequently lead to interesting and unusual solutions.

Unforeseen difficulties can occur almost immediately when the owner discovers the broad range of responsibilities that he must face. He must begin to formalize a business and financial plan. This entails some serious long-range planning regarding personal and business goals. In contrast to taking on all of the responsibilities himself, the successful owner will organize a team to assist him consisting of reputable designers, consultants, engineers, builders, equipment suppliers and installers, and production personnel who can visually and technically construct and operate the studio. He must also find a location for the facility — and of course find clients of his own; all this while he pursues his own particular means of employment.

One of the most difficult aspects of designing small recording-studio facilities is establishing appropriate acoustical criteria for sound isolation, background noise levels, reverberation time, room response, etc.

Ideally, the acoustical criteria for a small studio/control room should be the same as for a larger, more sophisticated studio/control room facility since the function within the room (music performance) is the same. However, for the smaller facilities, cost or space limitations often lead to some compromises from the ideal. Compromised criteria are valid — as long as the client is aware of the compromises and their ramifications.

Recording-studio criteria are partially based on personal preference. It is important to be able to discuss the intended criteria with the owner and recording engineers who will be utilizing the facility. They must feel comfortable and confident with the acoustics of the studio. Some like a flat, "dead" space (semianechoic), where all tonal variation, ensemble, and effects are done at the mixdown. Others may prefer a room which is "bright" (reflective at high frequencies) or "warm" (a predominance of low-frequency energy). It is important to uncover these preferences before launching into design. This is part of the reason why there is no such thing as a "standard" recording studio/control room design.

In addition to being functional, the studio environment must be aesthetically satisfying, relaxing, and comfortable for the musicians.

Optimal criteria for sound isolation between interior studio space and the exterior noise environment frequently requires complex building constructions of concrete or masonry in addition to independent secondary walls of gypsum board or plaster. The mid-frequency (500 to 1000 Hz) sound-isolating capability of this type of wall construction is in excess of 65 decibels (65dB). A less expensive compromised construction may consist of multiple gypsum-board construction on separate studs, offering 50 to 55 decibels of sound isolation.

Criteria for a studio and control room should provide for a very low background noise level. This will ensure the maximum dynamic range of the level of music performed and recorded. It will also keep unwanted extraneous noises from interfering with musicians' concentration and engineers' recordings. Obtaining a suitable background noise level requires control of mechanical equipment and air-handling-system noise and vibration, as well as the elimination of exterior and adjacent activity noise.

There is a series of criteria curves which are used for establishing noise levels during design and also when making acoustical measurements during evaluation. These curves are called **Preferred Noise Criteria (PNC) curves**. They define maximum noise-level limits for the full audible-frequency range. An optimal criterion might be the threshold of hearing (slightly below the PNC 15 curve). However, a frequently acceptable compromise criterion might be in the range of PNC 20 to 25. For comparison, a typical office criterion would be PNC 35, and a non-critical space such as a laboratory or public lobby would be PNC 40 (see Figure 1).

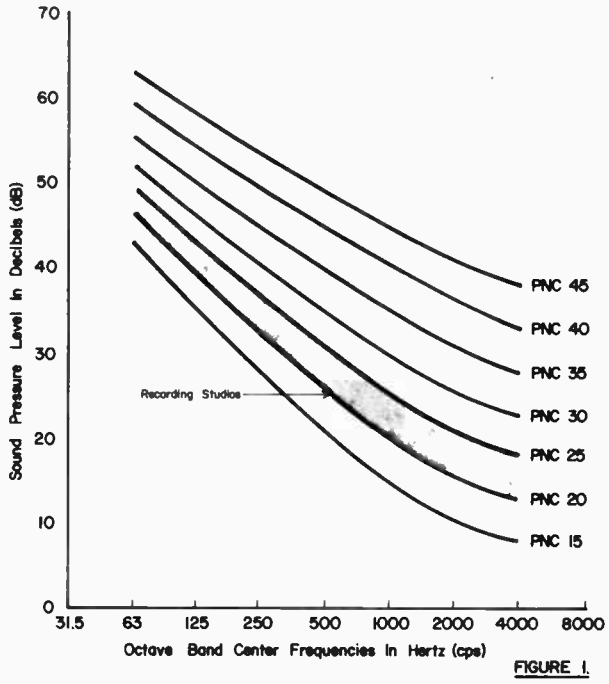


FIGURE 1.

PREFERRED NOISE CRITERIA CURVES

It should be noted that the music spectra produced by small groups performing popular or classical music are typically high in sound level and broad in frequency range (see Figure 2). In contrast, most building-construction materials are less efficient in isolating sound energy at the low end of the frequency scale than at the higher frequencies. This is the reason that one most frequently hears the thumping beat of the music from bass and drums and other percussion instruments, and not lyrics or high-pitched instruments, when listening in a space adjacent to where music is being performed.

This analogy also applies to apartment dwellers who may be bothered by neighbors' stereos or television sets. Applying sound-absorptive materials (acoustic tile, carpet, etc.) in the receiving, or listening, room where the annoyance exists will not improve the situation. The problem is one of inadequate sound isola-

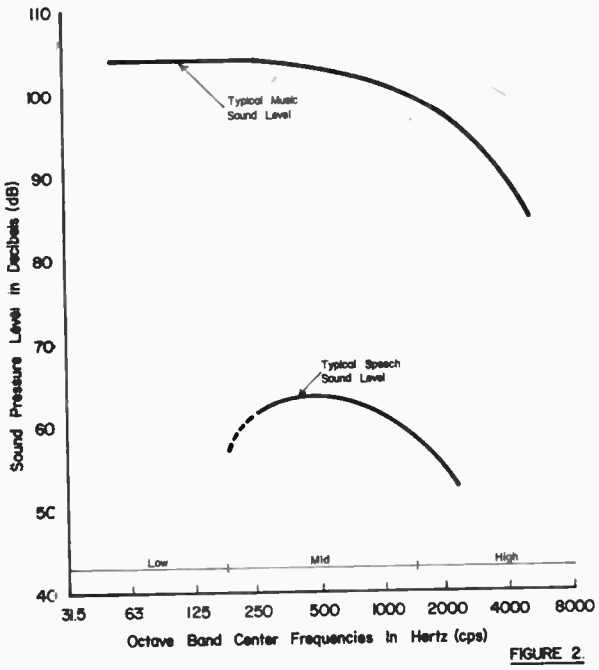


FIGURE 2.

SPEECH-MUSIC SOUND LEVELS

tion and can only be solved by utilizing construction materials with considerable mass, or lighter-weight multiple constructions with a deep airspace between them (see Figure 3).

The Design Process

One of the most important aspects of the design process is the evaluation of sites and buildings for potential studio locations. Many more locations are rejected than are accepted, which can be frustrating to the owner who is anxious to get his facility constructed and operating as soon as possible. It is interesting to note that many of the drawbacks obvious to the acoustical consultant, which can render a possible building or site totally unacceptable, are often not even recognized by the owner. Some of these are aircraft flight patterns, major traffic intersections, "flimsy" woodframe buildings, noisy nearby equipment, and extremely noisy (or sensitive) neighbors in adjacent occupied spaces.

When considering a proper location for the studio, sound isolation is of paramount importance. Proximity to clientele and accessibility are also important. The studio should certainly be remote from major modes of transportation. In addition to noisy exterior environments, ground vibrations should also be considered. Locating a good site for the studio may be a lengthy procedure. However, finding a suitable building or a quiet location will be well worth the time and effort, and can reduce initial construction costs of the building. It may also prevent costly downtime of studio operations should interference from conflicting adjacent activities occur.

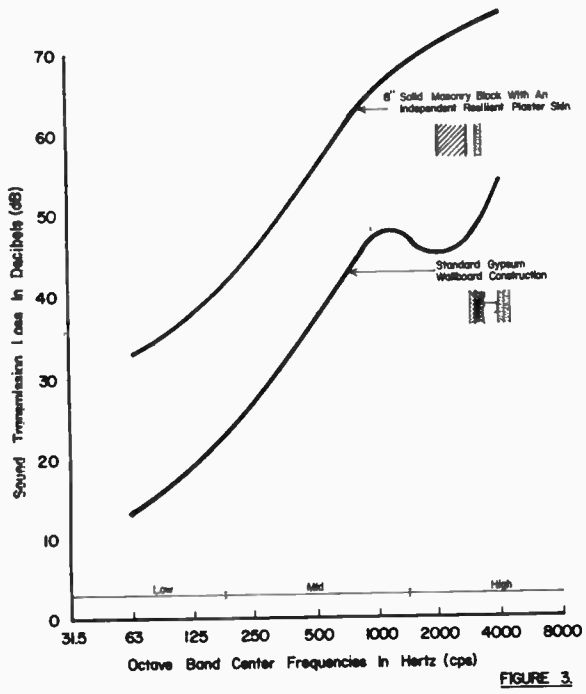


FIGURE 3.

WALL CONSTRUCTIONS

It can be confidently said that for an acoustical consultant the easiest part of a studio/control room project is designing the solutions on paper. The most difficult aspects of a project are: (1) becoming involved early enough to avoid potential acoustical problems (e.g., noisy locations, poor functional relationships, etc.), and (2) following up during construction — to make sure that critical details are actually constructed in accordance with the drawings and specifications, without having a construction worker unknowingly short-circuit a resiliently isolated pipe or ceiling system.

One of the most frequently encountered limitations in both small and large studios is lack of adequate ceiling height. There are no absolute values to be used since the ceiling height is related acoustically and architecturally to the plan dimensions. A ceiling height of eight feet is much too low for any kind of music-playing. For small studios, 12 to 14 feet would be desirable. For large studios, 18 or more feet are often required. In order to obtain uniform sound-pressure levels over a wide range of frequencies and to avoid detrimental buildup of room modes at particular frequencies, the aspect ratio of length-to-width-to-height of a room should avoid even or multiple increments (e.g. 1:1; 2:1, etc.).

The interior finish of a studio or control room is often of paramount importance to the owner and users. Certainly it is this aspect of an individual studio that creates a first impression. However, more important than visual aesthetics is how the space responds acoustically.

Studios require splayed surfaces of various dimensions to reflect sound energy at all frequencies in a diffuse manner. Sound diffusion is a difficult process to appreciate since it is not visible, and difficult to measure. An analogy can be made between diffuse light and sound fields. A prismatic lens is used on a fluorescent light fixture to diffuse the light, making the lighting environment more subtle, uniform, and comfortable. The results are similar for sound fields.

Low-frequency sound energy requires large surfaces to reflect sound (in excess of 10 feet in dimension), whereas high-frequency sound energy can be reflected diffusely from relatively small surfaces (i.e., four inches or less). In order to be reflective, particularly at low frequencies, a material must be impervious. It must also have considerable mass and stiffness characteristics. A single sheet of half-inch gypsum board framed on 24-inch centers will flex under pressure and absorb low-frequency sound energy. Multiple layers of gypsum board with closely spaced supports or masonry-block partitions have more surface density, are very stiff, and therefore prevent both sound absorption and sound transmission.

There will definitely be a need for sound-absorbing materials within the studio and control room. Fortunately, there are a wide variety of very attractive sound-absorbing finish treatments which can be uti-

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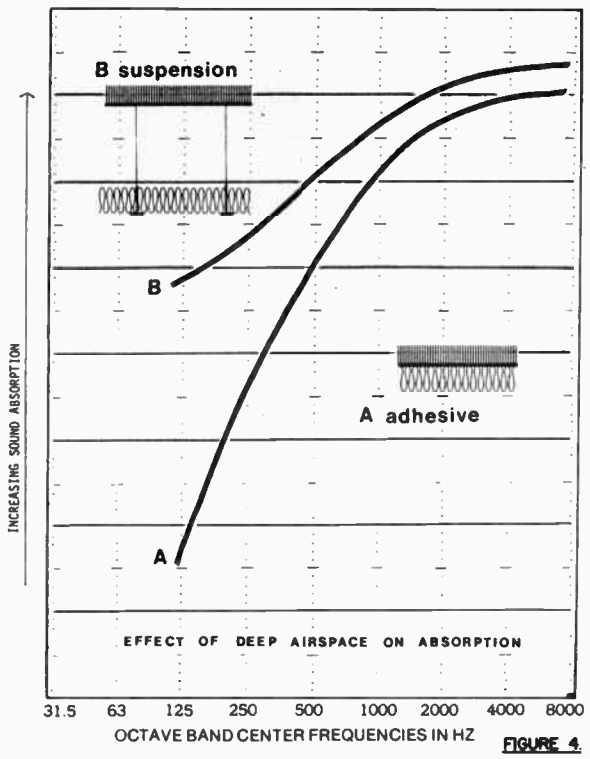

FIGURE 4.

lized. Fabrics utilizing colorful graphics and murals have frequently been used as facings on walls and ceilings. However, the important material which performs the actual absorbing function is behind the sound-transparent visual facing. A soft, fibrous material is required to efficiently absorb sound. Semi-rigid glass-fiber board is often used because of its ease of handling and its good sound-absorbing capabilities. The thickness of the material used will vary with the amount of absorption required. The thicker the material, the more effective it will be in absorbing sound energy, particularly at low frequencies. Another method of increasing the low-frequency absorption of a material such as glass fiber is to introduce airspace behind the material (see Figure 4). This will require that the material have a support system such as a metal grid, if used in the ceiling, or a wood frame if used on the walls. An open-weave metal mesh or spaced wood slats may also be required at the wall for physical protection.

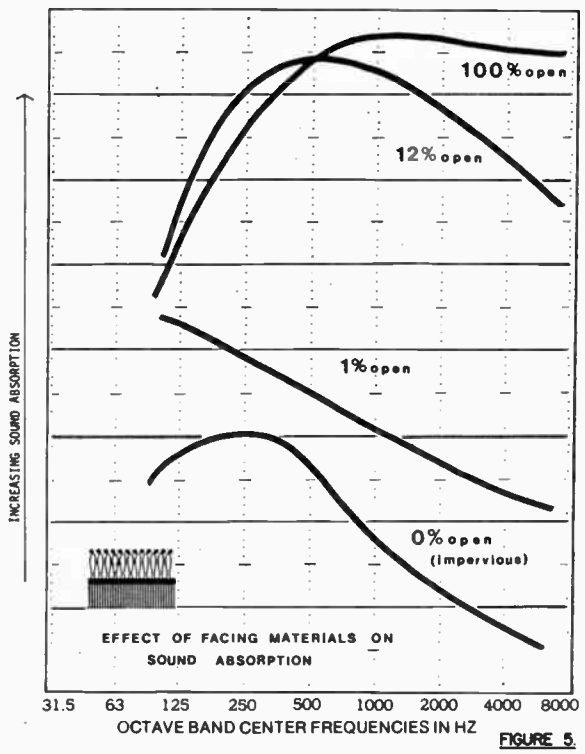

FIGURE 5.

The sound-absorbing characteristics of a material can be altered selectively on a frequency basis by its facing material (see Figure 5). Typically, most sound-absorbing materials are more efficient at high frequencies. As the facing becomes more solid and less sound transparent, the high-frequency absorption deteriorates and becomes less effective. This continues to occur until the facing becomes totally solid (0% open area). If the facing is thin, such as a vinyl film or a thin masonite panel, there will be almost no high-frequency absorption, but there can be a fair amount of low-frequency absorption due to the flexural resonance of the thin facing panel.

Conclusion

This article has attempted to discuss some of the practical architectural and acoustical considerations for studio and control room designs. It may have reiterated and, it is hoped, reinforced some already known basic facts.

With construction costs rising for all types of buildings, it is not uncommon to find that recording-studio facilities are costing in excess of $100 per square foot to build. The majority of successful studio complexes benefit from time and money being directed to acoustical considerations during the planning and design phases of their facilities.

The following is a checklist of architectural and acoustical items to consider when involved in the planning, design, or construction of a studio/control room complex.

☐ Define the nature of the facility and how it is used.

☐ Determine the degree of noise isolation from exterior sources.
— airborne and structure-born noise isolation from outside (aircraft, automobiles and trucks, machinery).
— gasket doors with tight-fitting closed cell compliant material.
— seal all major holes and openings in the construction.
— design the sound isolation of walls and roof as an equivalent building envelope.

☐ Determine the degree of noise isolation from within the studio complex.
— airborne and structure born noise control from adjacent occupied and noisy activities (vertically and horizontally).
— seal all major holes and openings in the construction.
— noise and vibration control from mechanical equipment and air handling system components (fans, ductwork, air terminal devices, light fixtures, etc).
— miscellaneous noise sources (lights, clocks, water coolers, creaking floors, etc).

☐ Determine appropriate interior room finish treatments.
— avoid strange and detrimental room responses to sounds generated within the studio (echoes, "flutter," "boominess").
— select effective high-frequency and low-frequency sound absorption.
— distribute sound absorbing materials on wall, floor and ceiling surfaces.
— consider adjustable sound absorption/reflection if it is appropriate.
— consider color, durability.

TIME MODULATION A BASIC PRIMER

by Stephen St. Croix

St. Croix conducting a seminar at AES in New York

Why time modulation? Why not an article on the ways to use delay? Because the manipulation of time as a means of achieving audio special effects is, in itself, a new and very special field of signal processing. In fact, it may well be one of the most powerful and interesting areas of signal processing that exists today. While the concept of time modulation did not even evolve until a few years ago, today evidence of experimentation and recording activity in this area may be heard every hour on the radio or T.V.

The audio results that can be achieved with time modulation are almost limitless; there always seems to be room for more. Every month several new records are released with new effects done with these techniques. Remember, I am not discussing five or six possible effects for the world to get sick of in six months, but a full range from the most bizarre dramatic ones to subtle enhancements of lead instrumentation.

Manipulation of the time base of an audio signal produces a spectrum of audio results, controlled by such factors as how the delay outputs and original signal are mixed, how much delay is used, what type and how much modulation is used, and the phase relationship of each audio channel involved.

Here are some examples of effects that are done by dynamic manipulation of time base, i.e. time modulation:

Flanging. Now, wait! It is true that we all know everything we ever wanted (and probably more) about good old flanging, but I am discussing serious wide sweep clean flanging — the kind that is now possible with today's delay technology. You hardly recognize it as the same effect that you have heard countless times, and it is not the same when you really take a closer look. A wide sweep flange done with a constant 15 kHz bandwidth and constant 100 dB dynamic range is a different effect.

1 First I will cover negative flanging. To create this effect, mix an inverted version of the delay line output with the original dry or straight

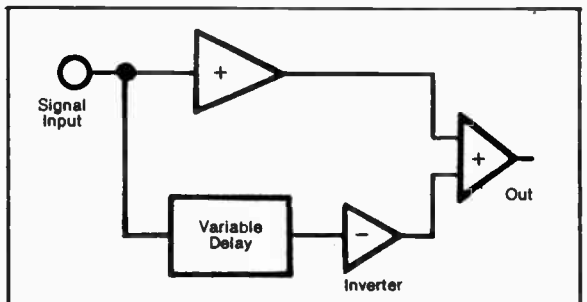

Figure 1

feed signal. Delay time is swept (usually by an internal oscillator) from about 150 microseconds to as much as 12 milliseconds. This mixed output contains a series of cancel nodes or notches. In this mode, the signal processor is acting as a comb filter. This name is derived from the comb like appearance of the frequency-response curve. As you change delay times, these notches squeeze together and spread apart, while always maintaining the same mathematical relationships. The quality and accuracy of this comb effect is of course directly related to the quality of the device you are using to generate it, and how it is being used. The maximum intensity of the effect is reached when those cancelled notches are at their deepest. This occurs when the level of the delay line output exactly equals that of the straight feed. As an example of what today's technology can offer, the Marshall Time Modulator is capable of about a 95 dB cancel depth as a result of unique summing circuitry.

To remain stable at these high-cancel figures, a delay line must have a constant output level as delay times are swept over the entire range. If it changes too much, the flange will weaken and thin out drastically. All analog-delay lines are subject to amplitude changes as you change delay over a wide sweep, whether they are conventional bucket brigade or CCD as in the time modulator. Because of this, special VCA gain compensating circuitry is employed in the time modulator.

2 Positive flanging is essentially the same as negative but the delay output is not inverted before the summing stage. This makes a definite

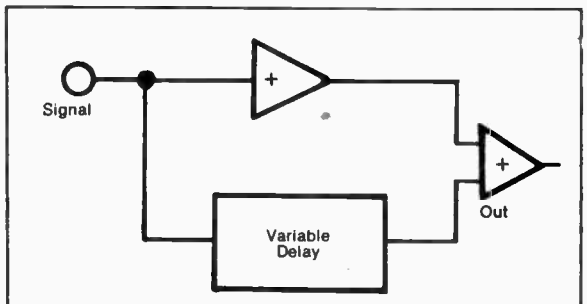

Figure 2

difference in the sound: while negative flange gave you an intense, thin effect, positive flange is the classic "jet sound" originally done manually with two tape decks. In fact, using today's technology, a dynamic range of 100 dB, frequency response of 15 kHz and sweep range of seventy to one are possible, making the effect much better than anything ever heard before. Remember that the original flange only had a 35 dB notch depth, while you can generate 95 dB today. Also the dynamic range of 100 dB eliminates the swishing that was an inescapable part of flanging in the past. Just as noise on the master tape killed subtleties there, the swish covered subtleties in the flange. The flanges being done today are a far cry from those of even three years ago.

3 Vibrato. This is very simple. The signal is put into the delay line, and a short delay center of possibly 20 milliseconds is chosen. Rapid delay sweeping is applied by a sine generator, and the Doppler effect alternately sharps and flats the signal: vibrato. A point to remember is that although the effect is simple, it must be of very high quality to be effective. A good dynamic range is needed for adding a small bit of vibrato to, say, an acoustic guitar track. Noise here would ruin the subtlety of the effect and let the listener know that it was electronically accomplished.

4 Pitch quantizing. This is an effect exclusive to the time modulator, and is popular enough to bear coverage here, as it is an excellent example of an extreme effect possible with voltage-controlled delay. As you increase the resonance of the delay line (turn up the feedback), you get to a point where the fundamental resonances of the line begin to impart a pitch of their own. The voice input is then processed to suppress pitch information — that is, the natural pitch of the voice — while still allowing the fricatives, consonants, and other speech formats to pass through the line. This information excites the delay line into controlled resonance, and the audio results at the output have the intelligibility of the original speech, but the pitch information of the delay line resonances. This pitch can then be controlled by any voltage such as that from a synthesizer keyboard. The effect can be anything from Darth Vader to heavy metallic vocoder effects, depending on various control settings.

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I think by now you are beginning to see what roles time modulation can play in a studio or on stage. Here are a few more ideas: auto pan by Haas location modulation. Here the straight dry channel is put, say, hard left, while the delayed version of that channel is hard right, with a few milliseconds of delay. The sound source will appear to emanate from the left channel, as a predicted Hass function. Now increase the level of the right channel until the image recenters. Now you apply a slow time sweep, and the image will shift left to right in a very full and different way. The psychoacoustic effect is very different than the conventional amplitude-panned approach.

Another interesting application is to pre-delay the send bus to your reverb unit, and slightly detune the send with Doppler time modulation. This results in a very fat, full reverb. Doppler detuning of this type has no glitches, and since it sweeps from flat to sharp of the input, the average final output is not out of tune at all, just very fat.

Arpeggio is another effect to think about: you modulate the delay line with a square wave instead of a sine, and you get out three notes for each note you put in; one sharp, one normal, and one flat. The output consists of each of these three notes one at a time. You may tune these notes over a four-octave range.

I have had people call in and tell me about applications that I never dreamed of, such as using the Doppler effect to correct occasional flat or sharp wrong notes in an already recorded vocal track. One studio that does production work actually uses the continuous delay aspect to return fake stereo records to mono for back-up tracks on AM radio spots. It seems that the artificial stereo spread is done be delay, and that delay must be, in effect, removed to reconstruct a useful mono image. If you just sum right and left, you get phase cancellation problems. The thing to do is apply delay to the straight non-delayed channel, and dial in what you need until a mono image (delay time matches the delay used on the other channel when the record was made). Then fine tune so that even the slightest phase problems disappear. For this, continuous no-step delay is a must.

In order to be able to produce all these effects, you must have a delay line capable of continuously sweeping (without any steps) over as wide a range as possible. Sweep ranges on the order of seventy to one or greater are needed if you want to be able to do slow (say 10 seconds) very wide band sweeps for flanges, pans, and many other effects.

This eliminates all digital delay lines as possible candidates for these effects, since they are limited to a maximum sweep range of four to one, and even that produces high-frequency loss.

In choosing a device for these effects, you must choose analog, as only this technique of delay generation has the capabilities of those extremely wide sweep ranges.

Remember that the quality of the effect is, of course, limited by the quality of the device, so check specs if you are looking. Loss of highs at long delays is a problem on some devices. It can severely weaken a flange or muddy a vocal double. Resonant effects such as pitch quantizing become unusable because the crispness needed for intelligibility is missing, as this high-end loss is compounded with each pass through the delay line (one hundred passes is typical for pitch quantizing).

The same goes for noise. It, too, is increased with each pass.

While an analog signal processor of this type may cost a fraction of the price of a digital delay line, the good units are still not cheap. The days of analog technology racing to match digital are gone. Now, better analog devices can match or exceed the digitals in performance, and are much more versatile, specifically in regard to time modulation.

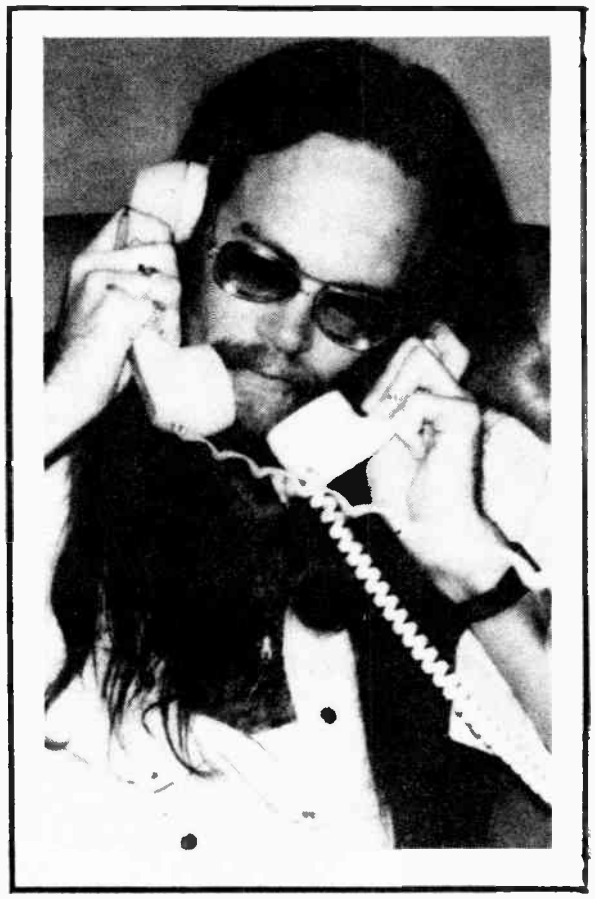
Versatility is a legitimate consideration. The Marshall Time Modulator is probably the most versatile effects generator, but it is also complex. Several other simpler units exist, and are very easy to operate. This versatility vs. complexity question is yours alone to evaluate — get used to it, because in this day of runaway technology, you will find yourself faced with it more and more.

Whatever your choice, the effects possible with time modulation are virtually endless, and you will undoubtedly come up with new ones of your own if you decide to join the thousands already involved.

You want to be sure that your investment gets you equipment that can keep up with coming changes and not become obsolete in a few months because the studio next door can "out-effect" you.

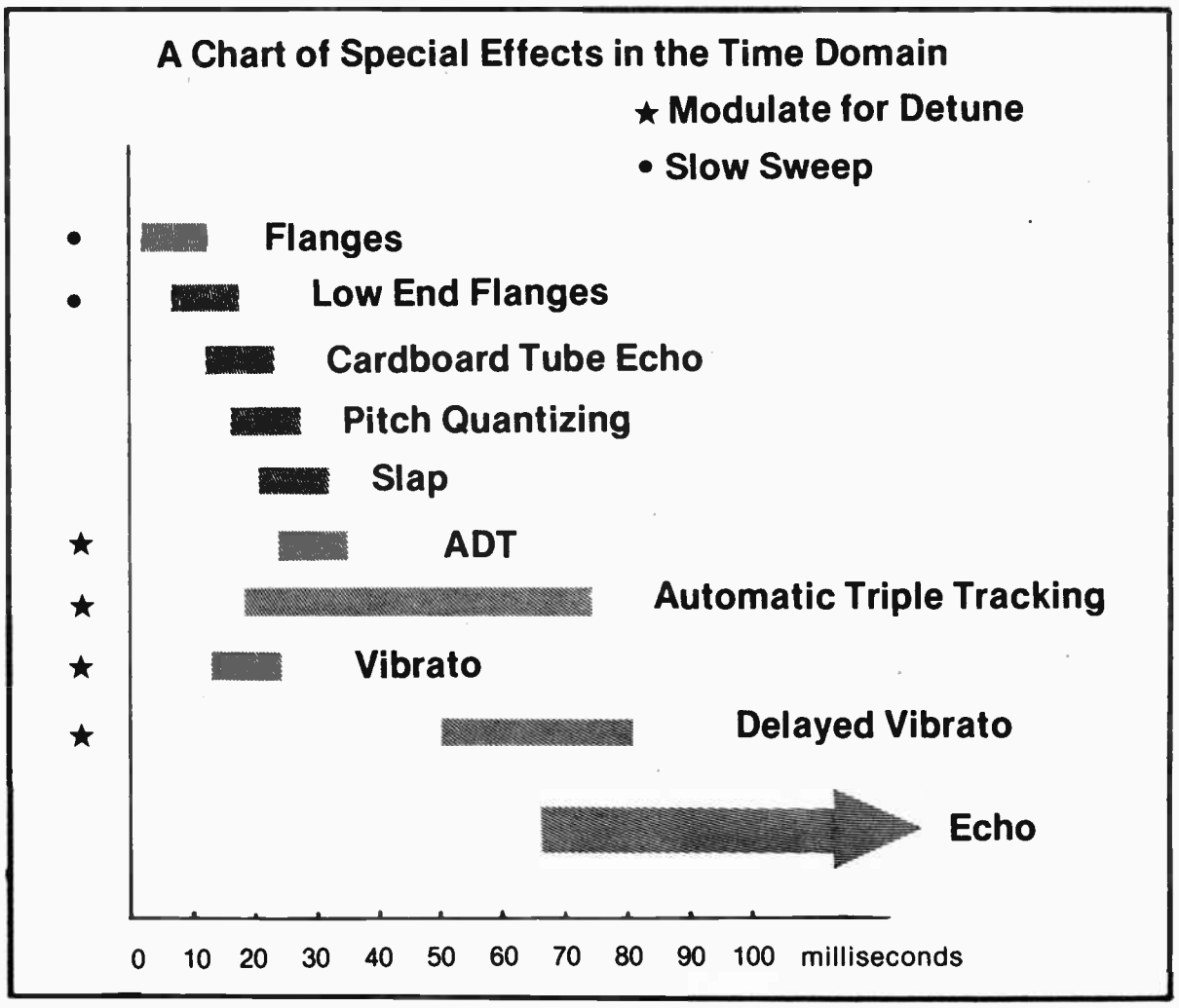
A recording of several examples of time modulation effects may be had free of charge by request to Marshall Electronics,

1205 York Rd.,
Suite 14,
Lutherville, Maryland 21093



Stephen St. Croix is a stage and studio musician with extensive background in special effects and signal processing. Some of his work may be heard on Stevie Wonder's "Songs In The Key Of Life".

As head of Research and Development at Marshall, his interest in innovative electronic effects for music played a large part in his development of the Time Modulator.



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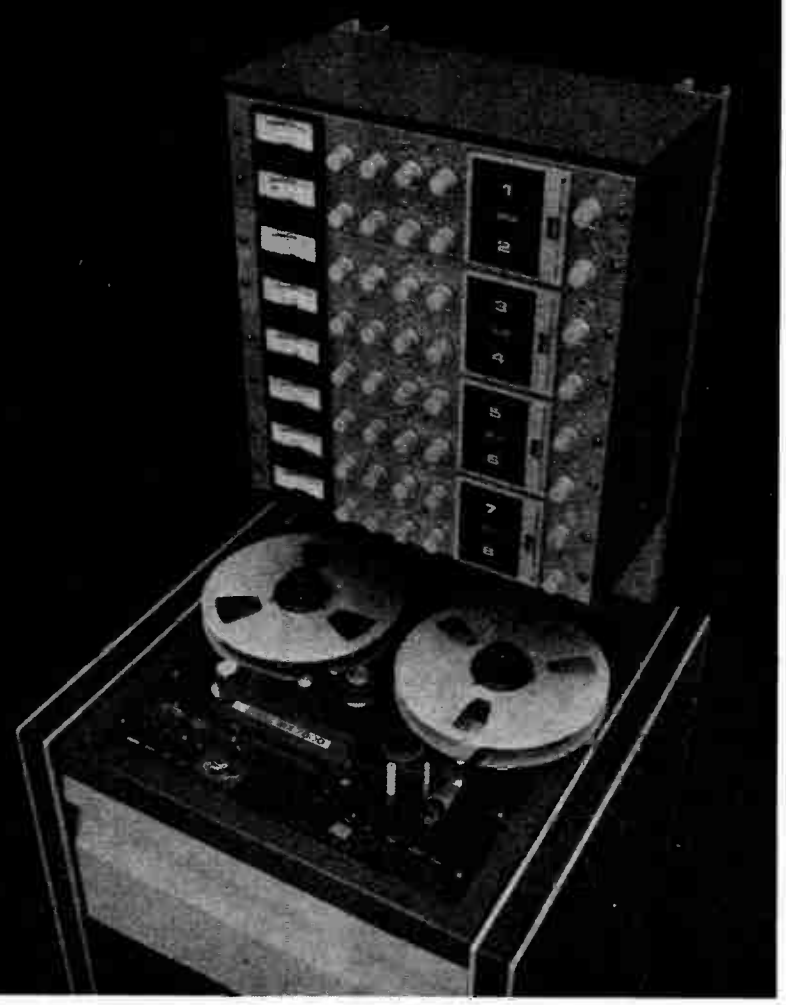
MX-7800: Full function capability with no compromise in reliability. Performance second to none. • Full-servo constant-tension tape drive • Dynamic braking • 30/15 ips operation • FET switching • $8895 suggested retail USA.



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RMS Sound
Call Greg 206/789/3365
Seattle, WA

Sound Genesis
Call Dave 415/285-8900
San Francisco, CA

Westlake Audio
Call Bruce 213/655-0303
Los Angeles, CA

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Call Jim 317/962-8596
Richmond, IN

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Call David 616/452-1596
Grand Rapids, MI

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Call Jon 612/729-8305
Minneapolis, MN

Ford Audio & Acoustics
Call Jim 405/525-3343
Oklahoma City, OK

Paul Westbrook Audio
Call Paul 512/578-4401
Victoria, TX

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Call Doug 205/942-9631
Birmingham, AL 35209

Hy James Enterprises
Call Henry 313/994-0934
Ann Arbor, MI

Houston Cinema & Sound
Call John 713/933-7180
Houston, TX

Gill Custom House
Call Al 312/598-2400
Palos Hills, IL

Ludwig Sound
Call Charles 713/449-8388
Houston, TX

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Roslyn, NY

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Cannonsburg, PA

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Call Charles 215/589-5312
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Call Peter 617/782-0600
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Clarence, NY 14031

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Call Tom 301/587-1800
Silver Spring, MD

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Call Ted 704/648-6012
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OTARI®

For information on other Otari products and dealers, call Ruth Pruett at 415/593-1648.
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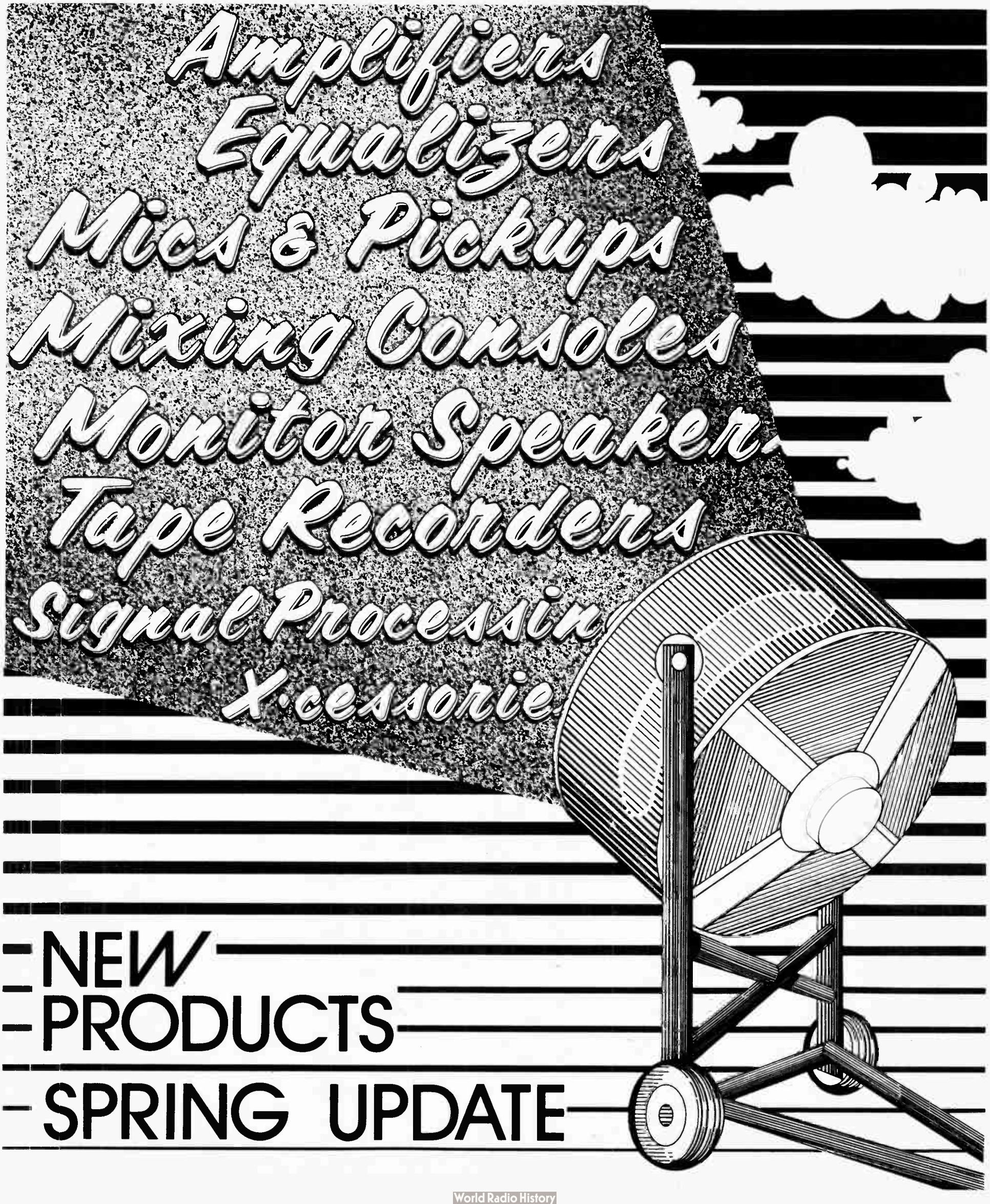

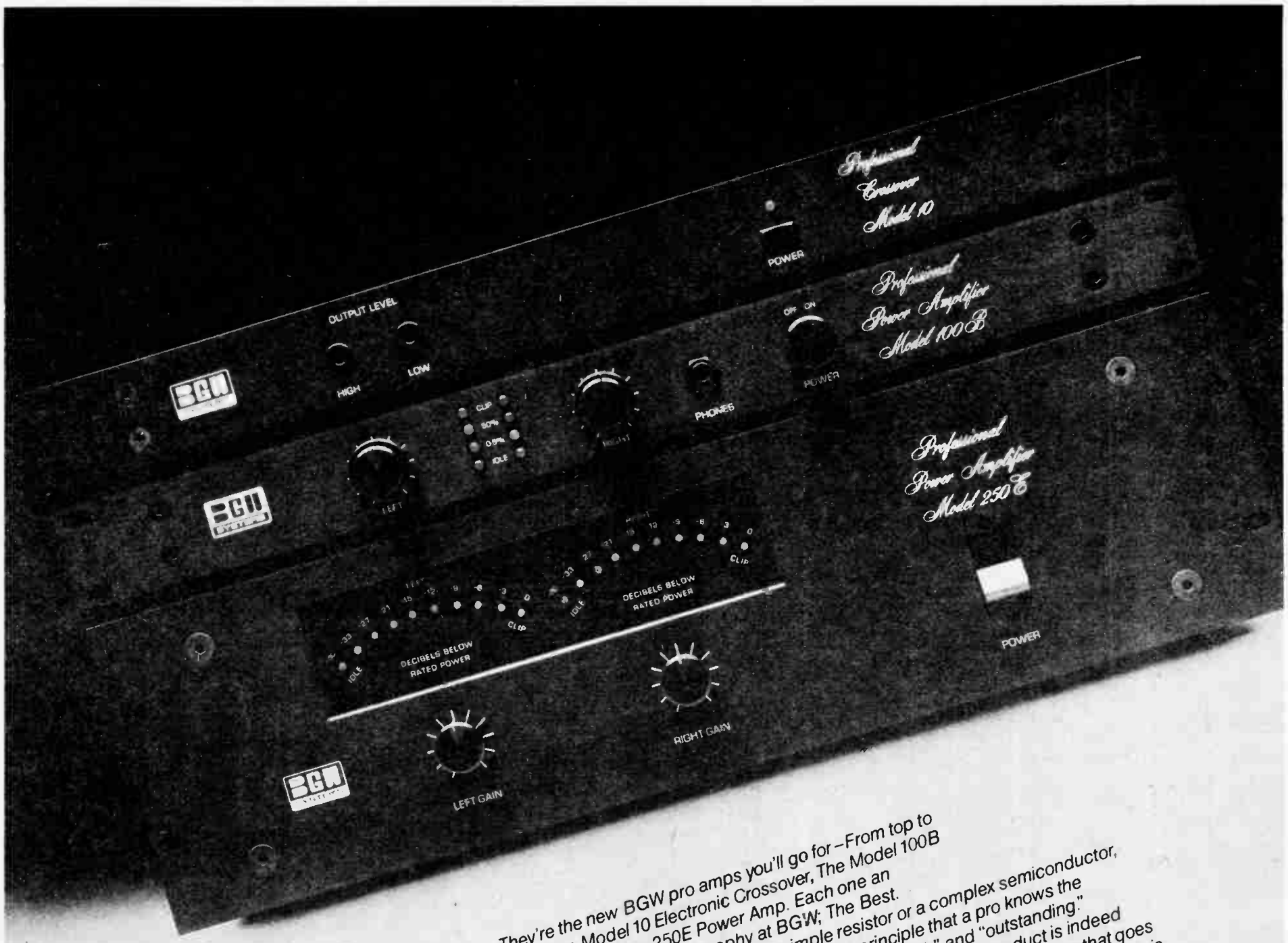

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They're the new BGW pro amps you'll go for—From top to bottom, The Model 10 Electronic Crossover, The Model 100B Power Amp, and the 250E Power Amp. Each one an extension of our basic philosophy at BGW; The Best.

Whether its a simple resistor or a complex semiconductor, BGW is dedicated to the principle that a pro knows the difference between "good enough" and "outstanding."

Because we know that quality in a pro product is indeed something you can see, touch and hear, everything that goes into a BGW product, everything we do in its manufacture, is designed to back up the man who depends on our gear to make his living. And, like all BGW products, the new 250E with our exclusive arc-scale power indicators joins with the new 100B and Model 10 in answer to your demands. They're worthy additions to the solid-gold reputation that's been earned in recording studios, discos and concert stages throughout the world.

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2001 Bryant Street, San Francisco, California, (415) 285-8900, TWX 910-372-7393

Amplifiers

BOGEN DIVISION, LEAR SIEGLER INC.
TECH-CRAFT TCB—S160 POWER AMPLIFIER
P.O. Box 500, Paramus, N.J. 07652
(201) 343-5700
Contact: J. Palmieri, Director of Sales.
Date Product Introduced: June 1978.
Product Description: Dual-channel amplifier, 80 watts per channel, designed for precision audio quality and continuous operation. Two direct-coupled amplifier circuits employ silicon transistors in all amplifier stages. Output circuitry drives any type speaker load. All components meet highest criteria for long-term performance and reliability. Unit can deliver power into adverse loads without major increases in distortion. Will even operate into a short circuit with no damage to the amplifier. Thermally protected to prevent damage due to excessively high temperatures.
Recommended Usages: Sound reinforcement in auditorium, theatre, disco night club.
Specifications: Rated Output Power: 80 watts continuous (rms) per channel; 160 watts continuous (rms) monaural.
Distortion: THD less than 0.1% from 10 - 20,000 Hz.
Intermodulation Distortion (60 Hz - 7 KHz, 4:1) less than 0.1% from .01 watts to 80 watts into 8 ohms.
Frequency Response: ±0.2 dB from 10 - 20,000 Hz at rated output.
Output Loads: 8 ohms per channel, 16 ohms monaural; safely drives any load including reactive loads.
Output Regulation: Less than 0.2 dB 10 - 20,000 Hz from rated load to no load.
Input Sensitivity: 1.23 V (+ 4 VU) for rated output.
Dimensions: 19"W x 5¼"H x 13"D. Standard EIA rack mounting.
Weight: 30 lbs.
Suggested List Price: $750.00

BOGEN DIVISION, LEAR SIEGLER, INC.
TECH-CRAFT TCH-S320 POWER AMPLIFIER
P.O. Box 500, Paramus, N.J. 07652
(201) 343-5700
Contact: J. Palmieri, Director of Sales.
Date Product Introduced: June 1978.
Product Description: Dual-channel amplifier, 160 watts per channel, designed for precision audio quality and continuous operation. Two direct-coupled amplifier circuits employ silicon transistors in all amplifier stages. Output circuitry drives any type speaker load. All components meet highest criteria for long-term performance and reliability. Unit can deliver power into adverse loads without major increases in distortion. Will even operate into a short circuit with no damage to the amplifier. Thermally protected to prevent damage due to excessively high temperatures.
Recommended Usages: Sound reinforcement in auditorium, theatre, disco, night club.
Specifications: Rated Output Power: 160 watts continuous (rms) per channel; 320 watts continuous (rms) monaural.
Distortion: THD less than 0.1% from 10 - 20,000 Hz.
Intermodulation Distortion (60 Hz - 7 KHz, 4:1) less than 0.1% at 160 watts into 8 ohms.
Frequency Response: ±0.2 dB from 10 - 20,000 Hz at rated output.
Output Loads: 8 ohms per channel, 16 ohms monaural; safely drives any load, including reactive loads.
Output Regulation: Less than 0.2 dB 10 - 20,000 hz from rated load to no load.
Input Sensitivity: 1.23V (+ 4 VU) for rated output.
Dimensions: 19"W x 7"H x 13"D. Standard EIA rack mounting.
Weight: 50 lbs.
Suggested List Price: $1,060.00

CARVIN MFG. CO.
ASG 600 POWER AMPLIFIER
1155 Industrial Ave., Escondido, CA 92025
(714) 747-1710
Date Product Introduced: January 1979.

Contact: Warren Flarity, Sales.
Date Product Introduced: January 1979.
Product Description: Stereo, level controls, meters, Bi-Amp crossovers, rack mountable, teak wood cabinet option, Bi-FET input, XLR inputs & outputs, 1260 sq. in. heat sink area.
Recommended Usages: PA use, stereo, hi-fi, bi-amp, disco, studio or road.
Specifications: Freq. response: 10-60K ± 1dB.
T.H.D.: .08% @ full power.
Separation: 60dB +.
Damping: 200 +.
Slew Rate: 35 V/ms.
Sensitivity: .8 VAC.
Bi-Amp filters: 800Hz 12dB/octave.
Weight: 55lbs.
Dimensions: W 21½, H 10, D 12.
Suggested List Price: $495.00

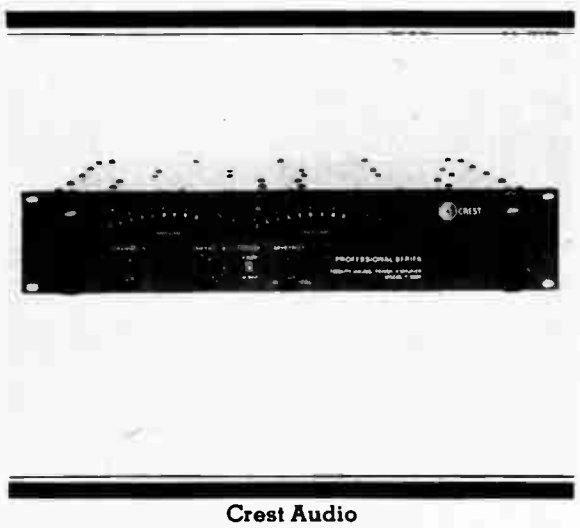
CERWIN-VEGA
CERWIN-VEGA A-200 AMPLIFIER
12250 Montague St., Arleta, CA 91331
(213) 896-0777
Contact: Michael Koehn, Public Relations.
Date Product Introduced: January 1979.
Product Description: The A-200 is a stereo power amplifier. It features fully complementary design. The latest generation of high speed output devices provides a new level of performance and reliability in professional amplification. Self resetting electronic circuits protect against DC output, overload, shorts, oscillations, and overheating, but will not trigger falsely with highly reactive loads. LED clipping indicators are accurate regardless of AC line voltage or load impedance. Switched fan outlet provided.
Recommended Usages: The A-200 can be used in any low to medium power application, including commercial sound reinforcement, disco, studio monitor, and playback use.
Specifications: Output power: 125 watts continuous per channel, 8 ohms (both channels driven); 240 watts continuous per channel, 4 ohms.
THD + N 20 Hz - 20K, 0.25w to rated output .02%.
IM Distortion (SMPTE) 0.25w to rated output .02%.
Power band width (IHF) 7 Hz - 100 KHz.
"A" weighted S/N ratio: 110 dB.
Slew rate: ►70v/usec.
Input sensitivity/impedance 1.4v/10K.
Input Connectors RCA (phono) or 1/4" phone.
Dimensions: 19 x 5.25 x 13 inches.
Weight 31 lbs.
Suggested List Price: $550.00

CERWIN-VEGA
CERWIN-VEGA A-400 AMPLIFIER
12250 Montague Street, Arleta, CA 91331
(213) 896-0777
Contact: Michael Koehn, Public Relations.
Date Product Introduced: January 1979.
Product Description: The A-400 is a stereo power amplifier. It features fully complementary design. The latest generation of high speed output devices provides a new level of performance and reliability in professional amplification. Self resetting electronic circuits protect against DC output, overload, shorts, oscillations, and overheating, but will not trigger falsely with highly reactive loads. LED clipping indicators are accurate regardless of AC line voltage or load impedance. Thermostatic fan cooling is built-in.
Recommended Usages: The A-400 can be used in any medium to high power application, including commercial sound reinforcement, disco, studio monitor, and playback use.
Specifications: Output power: 225 watts continuous per channel, 8 ohms, (both channel driven); 350 watts continuous per channel, 4 ohms.
THD + N 20 Hz - 20K, 0.25w to rated output .03%.
IM Distortion (SMPTE) 0.25w to rated output: .03%.
Power band width (IHF) 7 Hz - 100 KHz.
"A" weighted S/N Ratio: 113 dB.
Slew Rate: ►80v/usec.
Input Sensitivity/impedance 1.4v/10K ohms.
Input connectors RCA (phono) or 1/4" phone.
Dimensions: 19 x 7 x 14 inches.
Wright: 45 lbs.
Suggested List Price: $900.00

CERWIN-VEGA
CERWIN-VEGA A-600 AMPLIFIER
12250 Montague Street, Arleta, CA 91331
(213) 896-0777
Contact: Michael Koehn, Public Relations.
Date Product Introduced: January 1979.
Product Description: The A-600 is a stereo power amplifier. It features fully complementary design. The latest generation of high speed output devices provides a new level of performance and reliability in professional amplification. Self resetting electronic circuits protect against DC output, overload, shorts, oscillations, and overheating, but will not trigger falsely with highly reactive loads. LED clipping indicators are accurate regardless of AC line voltage or load impedance. Thermostatic fan cooling is built-in.
Recommended Usages: The A-600 can be used in any high power application, including commercial sound reinforcement, disco, studio monitor, and playback use.
Specifications: Output power: 350 watts continuous per channel, 8 ohms; both channels driven) — 600 watts continuous per channel, 4 ohms.
THD + N 20 Hz — 20K, 0.2w to rated output .03%.
IM Distortion (SMPTE) 0.25w to rated output .03%.
Power band width (IHF) 7 Hz — 100 KHz.
"A" weighted S/N ratio — 115 dB.
Slew rate: ►115v/usec.
Input sensitivity/impedance 1.4v/10K ohms.
Input connectors RCA (phono) or 1/4" phone.
Dimensions: 19 x 7 x 16 inches.
Weight: 70 lbs.
Suggested List Price: $1400.00

CREST AUDIO
CREST MODEL P-3500
18344 Oxnard St., B111, Tarzana, Ca 91356
(213) 881-8220
Contact: Bob Prideaux, Vice Pres., Marketing.
Date Product Introduced: January 1979.
Product Description: The all new Crest Model P-3500 is a "Low-Profile" professional power amplifier. Crest has designed a high quality, high performance amplifier with 250 watts per channel (8 ohms) and 400 watts per channel (4 ohms) all into a space saving 3½ inch rack mount package. The P-3500 incorporates a truly "state of the art" electronic design utilizing "Dual" independent power supplies, 10 highly efficient output devices per channel, advanced forced air cooling system, twin peak reading LED VU meters, and active balanced (or unbalanced) XLR and ¼ inch phone jack inputs.
Recommended Usages: The Crest P-3500 Power Amplifier is designed for every possible professional application. On the road, the P-3500 excels. The chassis is constructed of 16 guage steel; the electronic design is totally modular; the P-3500 is equipped with the most advanced thermal and speaker protection circuitry. Only 3½ inches high the P-3500 provides more power utilizing only one half the rack space necessary for conventional amplifiers. Disco operators are sure to appreciate the reliability factor allowing this amplifier to be "cooked" all night with complete confidence. For the recording studio the P-3500 offers performance specifications that delivers accurate distortion free sound reproduction.

Specifications: 250 watts per channel (8 ohms) with less than .03% Total harmonic Distortion, 400 watts per channel (4 ohms) with less than .05% THD and 800 watts mono (8 ohms) with less than .05% THD.
Suggested List Price: $1059.00 (also available without VU meters. Model P-3501 $959.00).



Crest Audio
Model P-3500 Power Amplifier

EDCOR
MIXER AMPLIFIERS
16782 Hale Avenue, Irvine, CA 92714
(714) 556-2740, (800) 854-0259
Contact: Wayne Wyche, Marketing Manager.
Date Product Introduced: May 1, 1979.
Product Description: 4 Mixer Amplifiers, Models MA-100, MA-130, MA-160, MA-220. The MA-100 has two inputs (Hi and LoZ) and 10-watt RMS output. The MA-130 is thirty watts, MA-160 sixty watts, MA-220 120-watts. These three mixer amps are 19" rack mountable, have capacity for six modular inputs, and two modular outputs. The output modules are either a multiple impedance module, or a transformer module for 75V or 25V.
Recommended Usages: Useful either as studio amps, or music amps in the 4, 8, 16, and C output module or as sound reinforcement amp for the commercial sound contractor with the 25 volt or 75 volt output module.
Specifications: Signal to noise ratio on 30, 60, 120 watt amps 124 dB.
The MA Series of amps are designed to be completely failsafe. With a diagnostic microprocessor, the amps constantly monitor all input and output functions. When the amps sense something wrong, they shut down automatically. When you resolve the problem, they come back up automatically with no reset button necessary.
Suggested List Price: Write Edcor for list prices.

ELECTRO-HARMONIX, INC.
SLAVE AMP 200
27 West 23rd St., New York, NY 10010
(212) 741-1770
Contact: Larry DeMarco, Customer Relations Mgr.
Date Product Introduced: September 1978.
Product Description: The Slave Amp responds to varying input levels by switching between 4 different classes of amplifier operation, allowing it to be unusually light, compact, efficient, and economical for its 200 wrms (375 watts peak) output to a 4 ohms load. Controls are Power, Volume, and Tone (6 dB cut or boost above 1.5 KHz). Standard 19" rack mounting chassis (5 3/16"H x 5 1/16"D) can also be used free-standing. Automatic shutdown for overheat or overload.
Recommended Usages: Virtually any power amplification requirement; can be driven from PA mixers, monitor sends, hi-fi preamps, etc.
Specifications: Power: (to 4 ohm load) 200 Watts rms, 375 watts peak; (to 8 ohm load) 100 watts rms, 185 watts peak.
Frequency Response: 40 Hz - 20 KHz, ± 3 dB.
Total Harmonix Distortion: 0.2%.
S/N Ratio: 90 dB.
Input Sensitivity (for full power output): 1.0 vrms.
Weight: 14 lbs.
Suggested List Price: $329.00

QSC AUDIO PRODUCTS
QSC POWER AMPLIFIER 3.7
1926 Placentia Ave., Costa Mesa, CA 92627
(714) 645-2540
Contact: Barry Andrews.
Date Product Introduced: January 1979.
Product Description: A mono power amplifier delivering 90 watts at 8 ohms and 150 at 4 ohms. Typical maximum distortion is 0.1% THD and 0.05% IM. The amp has balanced and unbalanced inputs, DC speaker protection, thermal protection, short circuit protection that is not affected by reactive loads,

Amplifiers

and fully complimentary outputs. The amp has been designed to be exceptionally stable and reliable under adverse and unusual conditions.
Recommended Usages: Any application requiring high quality, reliable mono power.
Specifications: Output power at 0.1% THD, 20-20kHz - 90 watts at 8 ohms, 150 watts at 4 ohms.
Frequency response 20-20kHz - +0, – 1dB.
Signal to Noise ratio 95dB.
Wide band damping factor (20-20kHz) greater than 200.
SMPTE IM distortion 0.05%.
Input Impedance 50K balanced, 25K unbalanced.
Suggested List Price: $298.00

QSC AUDIO PRODUCTS
QSC POWER AMPLIFIER 4.2
1926 Placentia Avenue, Costa Mesa, CA 92627
(714) 645-2540
Contact: Barry Andrews.
Date Product Introduced: January 1979.
Product Description: A stereo amp that delivers 40 watts at 8 ohms and 60 watts at 4 ohms per channel. Distortion is less than 0.1% THD and 0.05% IM. The amp has balanced and unbalanced inputs, dual power supplies, DC speaker protection, thermal protection, short circuit protection that is not affected by reactive loads, fully complimentary outputs, and calibrated gain controls. This amp is extremely stable and reliable under all the odd and adverse conditions found in pro audio applications.
Recommended Usages: A stereo amp that is suited for studio, stage, disco, or installations. Its moderate power makes it ideal for low power speakers or as a high frequency power amp to drive horns.
Specifications: Output power at 0.1% THD, 20-20KHz (per side)— 40 watts RMS at 8 ohms, 60 watts RMS at 4 ohms.
Frequency response 20-20kHz + 0, – 1dB.
Signal to Noise: – 95dB.
Wide band damping factor (20-20K): greater than 200.
SMPTE IM distortion: 0.05%.
Input Impedance: 50K balanced, 25K unbalanced.
Crosstalk (20-20K): – 70 dB.
Suggested List Price: $328.00

QSC AUDIO PRODUCTS
QSC POWER AMPLIFIER 5.1
1926 Placentia Ave., Costa Mesa, CA 92627
(714) 645-2540
Contact: Barry Andrews.
Date Product Introduced: January 1979.
Product Description: A stereo amp that delivers 80 watts at 8 ohms and 120 watts at 4 ohms per channel. Distortion is less than 0.1% THD and 0.05% IM. The amp has balanced and unbalanced inputs, dual power supplies, DC speaker protection, thermal protection, short circuit protection that is not affected by reactive loads, fully complimentary outputs, and calibrated gain controls. The features only tell part of the story. Much development time went into making the product extremely stable and reliable under all the odd and adverse conditions that come up in pro audio work.
Recommended Usages: A stereo amp that is suited for studio, stage, disco, or installations. Its medium power makes perfect for small full range systems, or as part of large bi or tri-amped systems.
Specifications: Output power at 0.1% THD, 20-20kHz (per channel): 80 watts RMS at 8 ohms, 120 watts RMS at 4 ohms.
Frequency response 20-20kHz: + 0, – 1dB.
Signal to Noise: – 95dB.
Wide band damping factor (20-20K): greater than 200.
SMPTE IM distortion: 0.05%.
Input Impedance: 50K balanced, 25K.
Crosstalk (20-20K): – 70 dB.
Suggested List Price: $388.00

QSC AUDIO PRODUCTS
QSC POWER AMPLIFIER 8.0
1926 Placentia Ave., Costa Mesa, CA 92627
(714) 645-2540
Contact: Barry Andrews.
Date Product Introduced: June 1978.
Product Description: This is the most fully featured high power amplifier available on the market today. All the features are provided on the standard version, there are no options to pay for. This stereo amp delivers (per channel) 175 watts at 8 ohms and 300 watts at 4 ohms. The amp's front panel has calibrated gain controls, output power controls, LED level indicators, distortion indicators, output power limiting indicators, AC power indicator, and AC switch. Rear panel features include 3 pin balanced inputs, ¼" unbalanced inputs, ¼" patching inputs, 5 way binding post outputs, ¼" jack outputs, output speaker protection fuses, AC circuit breaker, auxillary AC outlet, and cord warps. Internal features include fan cooling, individually fused output devices, and multi-tap power transformer.
Recommended Usages: Because of all the features this amp is well suited for just about any audio application from high power to low power. Its variable output limiting circuit insures that the amp protects whatever load it is driving. The output range is from full power all the way down to 2 watts, so it is able to protect even delicate high frequency drivers. This amp is being used heavily in disco applications and large PA systems.
Specifications: Output power per channel 175 watts RMS at 8 ohms, 300 RMS at 4 ohms, and 600 at 8 ohms in bridged-mono operation.
THD is 0.09% at 8 ohms rising gradually to 0.02% at 20kHz into 4 ohms.
Frequency response 15-30kHz.
Damping Factor 100.
Signal to Noise ratio – 95dB.
Input Impedance 10K to 35K.
Short circuit protection Semi-VA limiting, stable for reactive loads with phase angles of 60 degrees at 8 ohms.
Thermal protection: thermal cut-out.
Load protection: limiter, external output fuses, internal DC fault fuses — enables the amp to continue operation at a lower level by removing faulting section from circuit.
Suggested List Price: $748.00

UNI-SYNC, INC.
MODEL 200 PROFESSIONAL POWER AMPLIFIER
742 Hampshire Rd., Suite A, Westlake Village, CA 91361
(805) 497-0766
Contact: Jay Simmons, Sales Manager.
Date Product Introduced: December 1978.
Product Description: The Uni-Sync Model 200 is a powerful professional power amplifier which contains two totally independent 200 Watt amplifiers on a single 7 inch rack mount chassis. A unique temperature controlled variable speed (1 RPM to full speed) fan and highly efficient hand built power transformers, give the Model 200 rock solid stability under any load or environment. Special 150 watt pre-driver transistors insure safe operation into highly reactive and low impedance loads even in the mono bridged mode. The Model 200 is fully protected, including on/off trasient protection for the speakers.
Recommended Usages: The Model 200 has sucessfully proven itself in studio monitor, Disco, and sound reinforcement applications as well as heavy road use in touring and sound systems. It can be used in full range sound applications and in bi-amp or tri-amp usage with appropriate electronic crossovers. Balanced FET inputs through XLR or ¼ inch connectors give the amplifier flexibility to fit any sound application in a truly professional manner.
Specifications: Stereo Mode; 8 ohm load 200 watts, 20 Hz to 20 KHz, .03% THD;
Stereo Mode: 4 ohm load 300 watts, .01% THD;
Mono Mode: 8 ohm load 650 watts, 20 Hz to 20KHz, .05% THD;
Crosstalk: 1 KHz 130 dB, 20 KHz 100 dB.
Intermodulation Distortion: .01%.
Hum & Noise Level: – 105 dB.
Input Sensitivity: 2.0 volts for maximum output.
Frequency Response: – 3 dB, 1 Hz and 65 KHz.
Rise Time: less than 5 microseconds.
Slew Rate: 40 volts per microsecond.
TIM: .05%.
Damping Factor: Greater than 400.
Suggested List Price: $899.00

UNI-SYNC, INC.
MODEL 350 PROFESSIONAL POWER AMPLIFIER
742 Hampshire Road, Suite A, Westlake Village, CA 91361
(805) 497-0766
Contact: Jay Simmons, Sales Manager
Date Product Introduced: January 1979.
Product Description: The Uni-Sync Model 350 is a powerful professional amplifier which contains two totally independent 350 watt power amplifiers on a single 7-inch rack mount chassis, and is conservatively rated at 650 watts per channel into 2 ohms. Extra cooling is provided by two temperature controlled variable speed (1 rpm to full speed) fans. Four hand built power transformers and massive filter capacitors are used in the power supply. Protection features include on/off transient speaker protection, DC offset protection, current limiting and thermal protection. Easily bridged for mono.
Recommended Usages: The Model 350 has successfully proven itself in studio monitor, Disco, and sound reinforcement applica-

Ampelifiers

tions as well as heavy road use in touring and sound systems. It can be used in full range sound applications and in bi-amp or tri-amp usage with appropriate electronic crossovers. Balanced and unbalanced FET inputs through XLR or ¼ inch connectors give the amplifier flexibility to fit any sound application in a truly professional manner.
Specifications: Stereo Mode: 8 ohm load: 350 watts, 20 Hz to 20 KHz, .05% THD.
Stereo Mode: 4 ohm load: 500 watts, 20 Hz to 20 KHz, .08% THD.
Stereo Mode: 2 ohm load: 650 watts, 20 Hz to 20 K, .1% THD.
Mono Mode: 8 ohm load: 1000 watts, 20 Hz to 20 KHz, .1% THD.
Mono Mode: 4 ohm load: 1250 watts, THD .1% 20 Hz to 10 KHz.
Crosstalk: 1 KHz - 130 dB, 20 KHz - 100 dB.
Hum and Noise level: – 10 dB.
Input Sensitivity: 2.2 volts for maximum output.
Frequency Response: – 3 dB, 1 Hz and 65 KHz.
Rise Time: Less than 5 microseconds.
Slew Rate: 50 volts/per microsecond.
TIM: .05% IM: .01%.
Damping Factor: 8 ohm load: greater than 500.
Suggested List Price: $1549.00

U.S. PIONEER ELECTRONICS CORP.
SA-7800 STEREO INTEGRATED AMPLIFIER
85 Oxford Drive, Moonachie, NJ 07074
(201) 440-8100
Contact: R.I. Petty, Prod. Information
Date Product Introduced: January 1979.
Product Description: Non-switching power amplifier featuring magni-wide power range with super linear Ring Emitter Transistor, DC amplifier for flat and power amplifiers and Fluroscan peak power indicator.
Specifications: Continuous power output of 65 watts per channel, min. at 8 ohms from 10Hz to 20kHz with no more than 0.009% total harmonic distortion, or 65 watts per channel at 4 ohms from 10Hz to 20kHz with no more than 0.009% total harmonic distortion.
Suggested List Price: $450.00

U.S. PIONEER ELECTRONICS CORP.
SA-8800 STEREO INTEGRATED AMPLIFIER
85 Oxford Drive, Moonachie, NJ 07074
(201) 440-8100
Contact: R.I. Petty, Prod. Information.
Date Product Introduced: January 1979.
Product Description: Non-switching power amplifier featuring magni-wide power range with super linear Ring Emitter Transistor, DC amplifier for flat and power amplifiers, Fluroscan peak power indicator, separate winding power transformer for dual power supply and phono cartridge load resistance and capacitance controls.
Specifications: Continuous power output of 80 watts per channel, min. at 8 ohms from 10Hz to 20kHz with no more than 0.005% total harmonic distortion, or 80 watts per channel at 4 ohms from 10Hz to 20kHz with no more than 0.005% total harmonic distortion.
Suggested List Price: $550.00

U.S. PIONEER ELECTRONICS CORP.
SA-6800 STEREO INTEGRATED AMPLIFIER
85 Oxford Drive, Moonachie, NJ 07074
(201) 440-8100
Contact: R.I. Petty, Prod. Information.
Date Product Introduced: January 1979.
Product Description: Non-switching power amplifier featuring magni-wide power range with super linear Ring Emitter Transistor, DC amplifier for MC, EQ, flat and power amplifiers, fluroscan peak power indicator with dimmer switch, two power transformers for dual power supply and phono cartridge load resistance and capacitance controls.
Specifications: Continuous power output of 100 watts per channel, min. at 8 ohms from 10Hz to 20kHz with no more than 0.005% total harmonic distortion, or 100 watts per channel at 4 ohms from 10Hz to 20kHz with no more than 0.005% total harmonic distortion.
Suggested List Price: $750.00

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Equalizers

Applied Technology, Inc
Spectra Sound Products
Model 1000B 10-Band Graphic Equalizer

APPLIED TECHNOLOGY INC.
SPECTRA SOUND —
10-BAND GRAPHIC EQUALIZER MODEL 1000B.
2245 South West Temple, Salt Lake City, UT 84115
(801) 467-2842
Date Product Introduced: August 1978.
Product Description: The Model 1000-B is a professional 10-band graphic equalizer utilizing a high slew GSI circuit. The 1000-B utilizes a unique modular design allows for future circuit modification and overall ease of service. The unit has two independent channels of cut and boost of either ± 8 dB or ± 16 dB. Each channel includes a switchable infrasonic filter for eliminating low frequency transients. A five second delay prevents initial turn-on transients. The unit carries a two year warranty (limited).
Recommended Usages: Any audio system requiring high slew, low noise and distortion, and wide bandwidth.
Specifications: Circuitry: High slew GSI.
Frequency Response: .5 dB 20 Hz - 20 KHz.
Slew Rate: 13 volts/microsecond.
Distortion: THD— .008, IM— .008 Both typically .005 at any frequency 20 Hz to 20 KHz.
Signal/Noise: Greater than — 100 dBm at + 4 dBm.
Output Level + 18 dBm.
Control Range: Selectable/ ± 8 dB or ± 16 dB.
Input Impedance: Unbal.— 100K/bal 20K.
Output Impedance: Unbal— 100 ohms/bal 600 ohms.
Suggested List Price: Unbalanced $545.00
Balanced $595.00

APPLIED TECHNOLOGY INC.
SPECTRA SOUND
27 BAND 1/3 OCTAVE GRAPHIC EQUALIZER MODEL 1200-B
2245 South West Temple, Salt Lake City, UT 84115
(801) 467-2842
Date Product Introduced: April 1979.
Product Description: Identical high slew GSI circuit as described on the 1000-B except unit is a single channel 27 Band 1/3 octave with standard ISO frequencies.
Recommended Usages: Any audio system requiring high slew, low noise and distortion and wide bandwidth.
Specifications: Identical to 1000-B.
Suggested List Price: Balanced version: $695.00

ASHLY AUDIO INC.
ASHLY SC-63 MONO PARAMETRIC EQUALIZER
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager.
Dste Product Introduced: June 1979.
Product Description: The Ashly SC-63 is a three band mono parametric equalizer. Each band provides ± 15 dB of EQ range, tunes over a 5.6 oct. range, and will create a curve anywhere from 1/20 of an octave wide to 3 1/3 octaves wide. An input gain control provides 30 dB of range and a peak lite warns of impending overload in the equalizer. Switching is provided to defeat the EQ and also to facilitate level matching. Like it's big brother the SC-63 will generate response curves that cannot be matched by any other type of equalizer.
Recommended Usages: The Ashly SC-63 can be used anywhere a tone control is required. It is an excellent device to use for a console input that needs a little extra EQ or on a troublesome monitor mix. Stage instrument systems can take advantage of its flexibility. Typical applications also include feedback control, acoustical correction, improvement of microphone and speaker response, hum or noise filter, and special effects.
Specifications: Input Impedance: 10K balanced.
Output Impedance: 50 ohm terminate with 600 ohm or better.
Max. level In/Out: + 20 dBm.
Hum and Noise: — 87 dBv (eq in).
Distortion: Less than .05% THD, + 10 dBm 20 Hz - 20 KHz.
Size: 1¾" high 19" wide (rack mount) 6" deep.
Suggested List Price: $369.00

ASHLY AUDIO INC.
ASHLY SC-66/A STEREO PARAMETRIC EQUALIZER
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager.
Date Product Introduced: June 1979.
Product Description: The Ashly SC-66/A is a four band stereo parametric equalizer that provides infinite control of all equalization characteristics. Virtually any response curve can be generated because the SC-66/A is capable of being a very narrow band equalizer (1/20 oct.) as well as a broad band equalizer (3 1/3 oct.) or anywhere inbetween. Each band will tune over a 5.6 oct. range. New features include a master input gain control with 30 dB of range and an overall defeat switch. A defeat switch for each band is also provided. A peak overload lite warns of overload anywhere in the equalizer. The SC-66/A is designed for both live and studio use.
Recommended Usages: The Ashly SC-66/A may be used anywhere a tone control is required. Because it is so flexible the handling of tricky acoustical phenomena such as feedback, ring modes, and cabinet resonances is infinitely more precise than with any other equalizer. Any sort of acoustical correction is possible. Other applications include improvement of microphone and speaker response, hum or noise filter, and the generating of special effects. The two channels of the SC-66/A may be cascaded for eight band mono operation.
Specifications: Input Impedance: 10K balanced.
Output Impedance: 50 ohm, terminate with 600 ohm or greater.
Max. Level In/Out: + 20 dBm.
Hum and Noise: — 87 dBv (eq In).
Distortion: less than .05% THD, + 10 dBm, 20 Hz - 20 KHz.
Size: 5¼" high 19" wide (rack mount) 6" deep.
Suggested List Price: $599.00

AUDIOARTS ENGINEERING
MODEL 4200 STEREO PARAMETRIC EQUALIZER/PREAMPLIFIER
286 Downs Rd., Bethany, CT 06525
(203) 393-0887
Contact: Michael Shane, Audioarts Engineering
Date Product Introduced: Summer 1978.
Product Description: The Model 4200 is a stereo four band parametric equalizer/preamplifier with four dual-range filter sections to each channel. Each section is continuously variable in frequency setting, bandwidth setting, and boost or cut. Bandwidth is calibrated in octaves from 2 to .16 octave, ± 16 dB of boost or cut is available for each filter. Equalization curves are reciprocal. The unit has front panel gain controls for each channel, In/Out pushbutton switches for each filter section, overload indicators and master In/Out EQ. Besides the regular line level input there is a special low-noise preamp input to allow musical instruments to plug directly into the Model 4200. A monophonic version is available: the Model 4100.
Recommended Usages: Any use where precise control of equalization is desired... PA work, stage monitor use, recording, reproduction systems, broadcasting, discotheque, instrument preamp and equalization.
Specifications: Frequency Response: 20 Hz to 100 KHz ± ½ dB.
THD: .002% typical.
IM: .002% (.001% typical).
Signal to Noise: 110 dB (113 dB typical).
Slew rate: 12 volts/microsecond.
Maximum output: + 21 dBm into 600 ohms.
Maximum input: + 20 dB (+ 26 dB available).
Center frequency range: Section 1: 22 Hz to 3 KHz. Section 2: 22 Hz to 3KHz. Section3: 100 Hz to 10KHz. Section 4: 180Hz to 21KHz.
Bandwidth range: 2 octaves to 1/6 octave.
Boost/Cut range: ± 16 dB.
Dimensions: Model 4200 3½" rack, Model 4100 1.75" rack.
Suggested List Price: Model 4200 (stereo) list price: $599.00; Model 4100 (mono) list price: $332.00

B & B AUDIO (MARKETED BY APHEX SYSTEMS LTD.)
B & B EQF-3 PARAMETRIC EQUALIZER
7801 Melrose Ave., Los Angeles, CA 90046
(213) 655-1411
Contact: Kent S. Beyer, Sales Director.
Date Product Introduced: May 1979.
Product Description: A three-section tunable peak/shelf equalizer with tunable hi and lo pass filters, with detented controls: a resettable version of the now famous EQF-2.
Recommended Usages: All uses requiring equalization of the highest quality where repeatibility is desired or needed, such as mastering.
Specifications: Reciprocal 12 dB boost or cut over the full audio band, constant Q, expanded 600 resolution.
Standard modular size.
THD and IM distortion: worst case less than 0.1%.
Noise 113 dB below full output.
Suggested List Price: $500.00 for Jensen output transformer add $25.00 (for + 30 dBm output).

BOGEN DIVISION, LEAR SIEGLER, INC.
TECH-CRAFT TCE-100 EQUALIZER
P.O. Box 500, Paramus, N.J. 07652
(201) 343-5700
Contact: J. Palmieri, Director of Sales.
Date Product Introduced: June 1978.
Product Description: 2/3 octave equalizer incorporating latest integrated circuit technology. Employs 10 two-third octave active band-reject filters at ISO preferred center frequencies from 80 Hz to 5 KHz. Each filter can provide up to 14 dB of attenuation within its band. The individual filter controls are proportional, linear-action (slide) controls whose relative positions provide the operator with a graphic display of the equalizer response curve. Additional spectrum shaping is provided by continuously adjustable Hi and Lo-cut filters. The low frequency roll-off is continuously adjustable from 15 Hz up to 140 Hz, and the high frequency roll-off is adjustable from 25 KHz down to 4 KHz (— 3 dB points).
Recommended Usages: Tailoring of system frequency response to room acoustics, de-emphasizing specific frequencies to improve intelligibility, reducing acoustic feedback to increase system gain and compensate for non-linear frequency characteristics in transmission lines, equipment and transducers.
Specifications: Frequency Response: 20 to 20,000 Hz, ± 1 dB with filters flat or in bypass mode. Additional 6 dB/octave

Equalizers

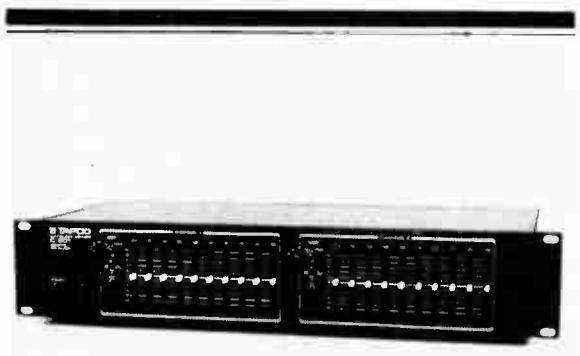
roll-off adjustable below 140 Hz, with low-cut filter, and above 4000 Hz with high-cut filter.
Impedances (Input & Output): Lo-Z Mic 25 - 600 ohm, Hi-Z Mic 33,000 ohm, Aux Input 50,000 ohm, Line Output 600 ohm.
Equivalent Input Noise: −126 dBm (20 - 20,000 Hz) (150 ohm source, 1000 ohm Z in).
Line Output Hum and Noise: 20 to 20,000 Hz: −86 dB below rated output: 300 to 20.000 Hz: −88 dB below rated output.
Rated Output: +18 dBm at 600 ohms with less than 0.5% THD 20 to 20,000 Hz.
Line Output Clipping Level, Min.: +21 dBm.
Input Clipping Levels, Min.: 20 mV, Lo-Mic; 350 mV, Hi-Z Mic.
Total harmonic Distortion: 0.5% maximum line output at +18 dBm into 600 ohm load from 20 to 20,000 Hz.
Suggested List Price: $400.00

BOGEN DIVISION, LEAR SIEGLER, INC.
TECH-CRAFT TCE-200 EQUALIZER
P.O. Box 500, Paramus, N.J. 07652
(201) 343-5700
Contact: J. Palmieri, Director of Sales.
Date Product Introduced: June 1978.
Product Description: 1/3 Octave equalizer employing 24 one-third octave active filter sections to produce the required band-reject or bandpass functions at ISO preferred 1/3-octave center frequencies from 63 Hz to 12.5 KHz. Each filter section can provide up to 14 dB of either boost or attenuation within its band or, where required, the boost function may be defeated with a Filter Action switch to provide an attenuate-only filter system. The individual filter controls are proportional, linear-action (slide) controls whose relative positions provide the operator with a graphic display of the equalizer response curve. Additional spectrum shaping is provided by two adjustable roll-off filters operating at the low (15 Hz to 150 Hz) and high (3 KHz to 30 KHz) ends of the band.
Recommended Usages: Tailoring system frequency response to room acoustics accentuating specific frequencies to improve intelligibility while simultaneously attenuating others to reduce acoustic feedback, and compensating for non-linear frequency characteristics in transmission lines, equipment, and transducers.
Specifications: Input Level: −10 to +10 dBm.
Input Impedance: 50,000 ohms.
Output Level: +18 dBm.
Output Impedance (true): Less than 60 ohms.
Load Impedance: 600 ohms or higher.
Distortion: less than 0.5% at +18 dBm.
Noise Level: 80 dB below rated output.
1/3 Octave Band Frequencies (Hz): 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1K, 1.25K, 1.6K, 2K, 2.5K, 3.15K, 4K, 5K, 6.3K, 8K, 10K, 12.5K.
Controls: 24 slide-type boost-attenuate or attenuate-only filters, 2 slide high and low-frequency rolloff filters, master Level control, Filter Action (Boost/Attenuate, Attenuate Only) switch, Filter Mode (In/Flat) switch, Power On-Off Switch.
Indicators: Positions of 24 filter controls provide graphic display of equalizer response curve; output overload LED indicator; power on-off indicator.
Frequency Response: Flat to ±14 dB at each 1/3 octave-band frequency from 63 to 12,500 Hz. Additional 6 dB/octave roll-off from 15 - 150 Hz, and from 3,000 to 30,000 Hz.
Suggested List Price: $990.00

EASTERN ACOUSTIC WORKS, INC.
PA-27
59 Fountain St., Box 111, So. Framingham, Mass 01701
(617) 620-1478
Contact: Ken Berger, National Sales Manager
Date Product Introduced: Los Angeles A.E.S. Convention May 1979
Product Description: The PA-27 is a one third octave equalizer designed to offer superior performance and flexibility due to its quality design, craftsmanship and components. The unit is designed to operate in hostile environments (i.e.: mobile studios, and PA systems).
Recommended Usages: Application encompass radio and television broadcasting, studio recording, PA systems, sound measurement and analysis systems.
Specifications: Input Impedance: 22K.
Output Impedance: 62 ohms.
THD less than .05%.
Headroom 20 dBm.
Suggested List Price: $570.00

ELECTRO-HARMONIX, INC.
TEN BAND GRAPHIC EQUALIZER
27 West 23rd St., New York, NY 10010
(212) 741-1770
Contact: Larry DeMarco, Customer Relations Mgr.
Date Product Introduced: September 1978.
Product Description: Employs 10 active band pass filters, 32 Hz through 16 KHz in octaves. High impedance, unbalanced inputs. Power switch and LED indicator. AC power, regulated.
Recommended Usages: Suitable for use with guitar pick-ups high impedance microphones, accessory and mixer outputs.
Specifications: Input Impedance: 1 Megohm.
Output Impedance: 50 ohms.

Filter Gain: ±15 dB.
3 lbs.
Suggested List Price: $119.00



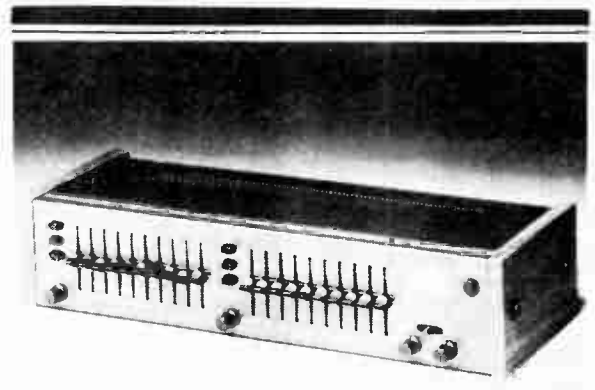
EV-Tapco
Model C-201 Graphic Equalizer

EV—TAPCO
C-201
3810 148th Ave. N.E., Redmond, Wn. 98052
(206) 883-3510
Contact: See your Tapco advanced products dealer.
Date Product Introduced: February 1979.
Product Description: The C-201 is a 10 band, 2 channel graphic equalizer with both balanced and unbalanced inputs plus unbalanced/AGLC outputs. High slew rate, low noise design with AutoPad® gain controls. All EQ controls center detented for easy use in a 3½" x 19" package. EQ outputs are relay protected to prevent turn-on/off transients.
Recommended Usages: The C-201 can be used in any pro or semi-pro sound reinforcement/recording situation. Balanced capability also allows use in broadcasting or any high quality audio system including disco.
Specifications: Frequency Response: 20 - 20KHz ±1dB.
Signal to Noise Ratio (20KHz NBW, 600 ohms in/out: 10 dB (below maximum output).
THD (maximum output, 600 ohms): ◄.05%.
SMPTE IM Distortion: (max. output 600 ohms) ◄.05%.
CCIF IM Distortion (19 - 20KHz mixed 1:1, max. output): ◄.05%.
Slew Rate: 11 volts per microsecond.
Rise Time: 2.4 microseconds (100KHz, 10v pp).
Suggested List Price: Pro Net $327.00

INTERNATIONAL ELECTRO-MAGNETICS, INC.
OPTRO 231 1/3rd OCTAVE GRAPHIC EQUALIZER
350 N. Eric Drive, Palatine, Illinois 60067
(312) 358-4622
Contact: Tony Pretto, Sales Manager.
Date Product Introduced: June 1978
Product Description: A 31-band equalizer 20hz to 20kHz, offering ±12 dB boost or cut. Center detents provide ready zero reference. Silent in-out push button operation. 600 ohms balanced line or 40K bridging input switch. Overall gain from infinite attenuation to +10 dB with better than .1% distortion 20Hz to 20kHz.
Recommended Usages: Useful for sound reinforcement, monitors EQ, and noise removal from program material in remix.
Specifications: ±1.dB 20Hz - 20KHz frequency response.
±12dB range.
+24dBm into 600 ohm load — rated output.
95dB below rated output — signal to noise.

ORBAN ASSOCIATES INC.
672A EQUALIZER
645 Bryant St., San Francisco, CA 94107
(415) 957-1067
Contact: John Delantoni, Marketing Manager.
Date Product Introduced: March 1979.
Product Description: The orban 672A is a cost-effective, professional, quasi-parametric equalizer with the convenience of graphic-type EQ controls. Wide-range high and low-pass filters with 12dB/octave Butterworth slopes follow the graphic section for added versatility. The 672A has two outputs, arranged so that these filters can also be used as a full tunable electronic crossover. The 672A is a fully professional product designed to provide a large measure of versatility, convenience and quality at a very attractive price.
Recommended Usages: Sound reinforcement: in all cases, the control can be adjusted to make the totally non-interacting (series-connected) bands "combine"; a most desirable characteristic in sound reinforcement. Recording studios: every recording studio needs a few channels of 672A equalization to handle the tough chores that the internal console equalizers can't deal with. Motion picture sound: the 672A is an ideal replacement for the graphic equalizers ordinarily used for dialogue equalization in motion picture sound. Broadcasting: use the 672A in the production studio to enhance the announce mike, and to create special production effects. Discos: the 672A can offer the exact sound desired — including solid, punchy bass, free from muddiness and boom — and an aggressive sizzling top.
Specifications: Electrical input: Nominal input level: between −10 and +4dBm. Absolute overload point: +26dBm.
Output: Nominal output level: +4dBm. Max. output level before clipping: +19dBm, 20-20,000 Hz.
Frequency response: ±0.25dB, 20-20,000 Hz: EQ controls set at "0" detents.
Available Gain: +12dB; adjustable to infinity by means of front-panel gain control.
Slew Rate: varies between 6 and 13VuS depending upon setting of gain control.
Total Harmonic Distortion: less than 0.05%, 20-20,000 Hz, (+18dBm).
SMPTE Intermodulation Distortion: less than 0.05% (+18dBm: 60/7000Hz, 4:1).
Noise at Output: Less than −84dBm, controls centered.
Suggested List Price: $499.00

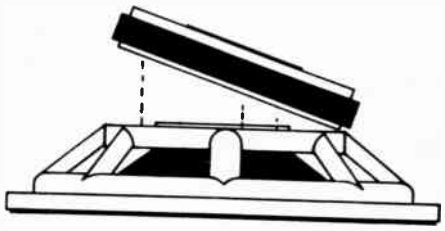
PHASE LINEAR CORPORATION
1100 SERIES TWO
20121 48th West, Lynnwood, WA 98036
(206) 774-3571
Contact: Bruce Lowry, National Sales Manager.
Date Product Introduced: May AES 1979.
Product Description: Stereo 5 Band Parametric Equalizer featuring ±12 dB of amplitude adjustment, 9:1 frequency adjustment and 10:1 band-width adjustment. Includes bypass, tape monitor and power pushbuttons as well as overall level controls and peak overload LED's.
Recommended Usages: Room equalizer (EQ), line EQ, Tape EQ, Ring Mode suppression (notching), instrument tone contouring.
Specifications: THD and IM at 2 volts output: 0.02% (20 - 20 KHz).
Slew Factor: Greater than 5.
Channel Separation: 100 dB at 1 KHz, 80 dB at 20 KHz.
Center Frequencies: 63 Hz, 250 Hz, 1 KHz, 4 KHz, 16 KHz.
Input Impedance: 50 K-ohms.
5½" x 19" x 8".

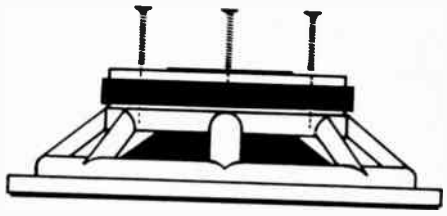


TEAC Corporation of America
Model GE-20 Graphic Equalizer

TEAC CORP. OF AMERICA
GE-20 GRAPHIC EQUALIZER
7733 Telegraph Rd., Montebello, Ca 90640
(213) 726-0303

The combination of a rigid cast-aluminum frame and high-efficiency magnetic structure is a feature found in many professional quality loudspeakers. What places the Black Widow Series far ahead of its competition is its field replacable basket assembly.





This feature, usually found only in high quality compression drivers, allows the user to be "back in business" in a matter of minutes, rather than days or weeks.

The high efficiency and high power handling capabilities found in the Black Widow make each model the best choice for its sound reproduction application. Again, what separates the Black Widow from other high quality transducers is its unique integral coil form/dome structure. When a loudspeaker is subjected to very high power levels, the voice coil temperature rises very rapidly, causing the loudspeaker impedance to increase. The result of this increase is a loss of efficiency. The Black Widow Series provides a most effective method of minimizing any impedance increases due to heat by utilizing the one-piece coil form/dome as a heatsink. Just as high power amplifiers use aluminum heatsinks to dissipate heat, the Black Widow coil form/dome is produced with low mass, high rigidity aluminum.

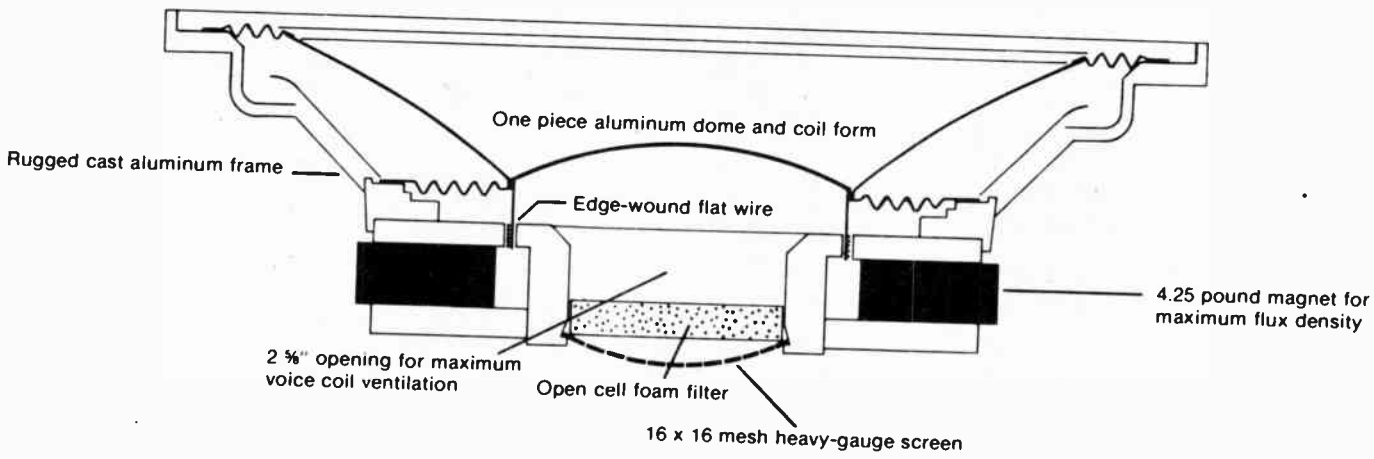
Each Peavey Black Widow is subjected to extensive quality control procedures to insure long field life and high reliability. The manufacturing methods employed by Peavey, such as numerical and computer controlled machining equipment, allow the Black Widow to maintain the close tolerances necessary for previously unattainable levels of quality and consistency.

Each Black Widow has a four-inch edge-wound aluminum wire voice coil to provide maximum energy conversion. The cone assemblies provide the required frequency response shapes with minimum weight and maximum structural integrity for high mechanical reliability. Each magnetic structure is fully removable and will provide minimum flux density of 12,000 gauss with very precise operating clearances. The magnetic structure uses a large rear vent to assist in further voice coil temperature control.

The Peavey Black Widow is now offered as standard equipment or as an option in most Peavey enclosures and will soon be available "over the counter" at selected Peavey Dealers.

The Peavey Black Widow,...for those who can't accept less than maximum performance and reliability from their speakers.

PEAVEY ELECTRONICS
711 A Street
Meridian, Mississippi 39301



MODEL NO.	DIAMETER	NOMINAL IMPEDANCE	POWER HANDLING CAPACITY CONTINUOUS	PROGRAM	SENSITIVITY 1w, 1m on axis	VOICE COIL DIAMETER
1201	12"	4/8	150W	300W	101 dB	4"
1501	15"	4/8	150W	300W	103 dB	4"
1502	15"	4/8	150W	300W	101 dB	4"
1503	15"	8	150W	300W	102 dB	4"
1801	18"	4/8	150W	300W	99 dB	4"

Equalizers

Contact: TEAC Consumer Relations.
Date Product Introduced: January 1979.
Product Description: The GE-20 is the first budget-priced studio designed 10-band graphic equalizer on the market. Each channel has variable input & output controls with overload LED's on the inputs. It also has a VU meter switchable to L-R-Off. There is unaffected foldback from each input providing the dry source signal to another device if desired. Two sets of outputs from equalizer sections can feed monitor system and tape deck simultaneously
Recommended Usages: This unit can be used for both recording and mixdown in the studio or in the home system. Variable level controls and overload LED's on the inputs help eliminate distortion that would otherwise be attributed to the source. Each band has it's own operational amplifier rendering more efficient performance in terms of distortion, impedance variation, level loss and longevity.
Specifications: Input level: – 100 dB (0.3V) unbalanced.
Output Level: – 10 dB (0.3V) max. output + 18 dB (8V).
Load Impedances: Input greater than 100K ohms, output greater than 10K ohms.
Headroom 28 dB.
S/N: 85 dB.
Frequency Response: 20 Hz - 30 KHz ± 0.5 dB.
THD: 0.3%.
Filters: Highpass at 31.5 Hz & lowpass at 16 KHz.
Suggested List Price: $350.00

UNITED RECORDING ELECTRONICS INDUSTRIES
MODEL 535 DUAL GRAPHIC EQUALIZER (OCTAVE)
8460 San Fernando Rd., Sun Valley, CA 91352
(213) 767-1000
Contact: E.J. Consen, V.P. Marketing
Date Product Introduced: May 1979 at AES Show in LA.
Product Description: Model 535 Dual Graphic Equalizer. Successor to the popular UREI Model 530, this new dual (stereo) unit provides in one 19" x 3½" york mounting package two separate, 10-band graphic equalizers, with controls centered on standard ISO one octave center frequencies from 31.5 Hz to 16 KHz. Overload indicator LED's. Smooth combining for minimum ripple. ± 12 dB control range at each frequency. Signal-to-Noise better than 110dB
Recommended Usages: For creative equallization in music or speech recording; corrective equalization in sound reproduction; disc, film and tape transfers; disc mastering equalization; sound reinforcement EQ; High fidelity music systems.
Specifications: Universal input, balanced or unbalanced;
Max input level + 20 dBm, variable gain – 10dB to + 20dB.
Output: transformer isolated, output power + 24 dBm, 10 EQ sections, one octave, 31.5 Hz to 16KHz;
Range of boost and cut 1 to 12 dB, single filter section.
Signal-to-Noise better than 110 dB at full output.
Suggested List Price: $424.00

UNITED RECORDING ELECTRONICS INDUSTRIES
MODEL 537 1/3-OCTAVE GRAPHIC EQUALIZER
8460 San Fernando Rd.,Sun Valley, CA 91352
(213) 767-1000
Contact: E.J. Consen, V.P. Marketing.
Date Product Introduced: October 1978
Product Description: Model 537 is an active filter set for general purpose audio equalization. Worthy successor to the UREI 527-A, it offers greatly improved signal to noise and increased control range. 12 dB boost or cut at each of 27 frequencies, centered at 150 standard increments from 40 Hz to 16 KHz. Overload indicator LED. Excellent combining.
Recommended Usages: General creative or corrective equalization in sound recording and reproduction.
Suggested List Price: $736.00 Contact factory for specs.

Mics & Pickups

AUDIO-TECHNICA U.S., INC.
ATM-10SM
33 Shiawassee Ave., Fairlawn, OH 44313
(216) 836-0246
Contact: Charlie Winkler, Mktg. Mgr., Music Products
Date Product Introduced: January 1979.
Product Description: Omni-directional, fixed charge condenser instrument microphone. Uses new rear electret principle so that element diaphragm can be made thinner and lighter, thus providing improved frequency and transient response. Unit is packaged with professional external shock mount, to isolate microphone from stage noise, windscreen, and stand clamp in vinyl carrying case.
Recommended Usages: Piano, overhead drums, toms, hi hat, cymbals, acoustic guitar.
Specifications: Frequency response: 40 - 18,000 Hz.
Sensitivity: – 48 dBm.
Impedance: 600 ohms balanced.
Battery: 1.5V AA Penlight.
Suggested List Price: Professional Net Price $115.00

AUDIO-TECHNICA U.S., INC.
ATM-11SM
33 Shiawassee Avenue, Fairlawn, OH 44313
(216) 836-0246
Contact: Charlie Winkler, Mktg. Mgr. Music Products
Date Product Introduced: January 1979.
Product Description: Uni-directional, fixed charge condenser instrument microphone. Uses new rear electret principle so that element diaphragm can be made thinner and lighter, thus providing improved frequency and transient response. Unit is package with professional external shock mount, to isolate microphone from stage noise, windscreen, and stand clamp in vinyl carrying case.
Recommended Usages: Piano, overhead drums, toms, bass drum, hi hat, cymbals, acoustic guitar, brass, reeds, flute.
Specifications: Frequency Response: 50 - 20,000 Hz.
Sensitivity: – 56 dBm.
Impedance: 600 ohms balanced.
Battery: 1.5 V AA Penlight.
Suggested List Price: Professional Net Price: $130.00

AUDIO-TECHNICA U.S., INC.
ATM-21SM
33 Shiawassee Avenue, Fairlawn, OH 44313
(216) 836-0246
Contact: Charlie Winkler, Mktg. Mgr. Music Products
Date Product Introduced: January 1979.
Product Description: Uni-directional, dynamic instrument microphone Features shock mounted capsule. Unit is package with professional external shock mount to isolate microphone from stage noise, windscreen, and stand clamps in vinyl carrying case.
Recommended Usages: Piano, Leslie, overhead drums, toms, bass drum, hi hat, cymbals, amplified instruments, acoustic guitar, brass, reeds.
Specifications: Frequency Response: 50 - 15,000.
Sensitivity: – 60 dBm.
Impedance: 600 ohms balanced.
Suggested List Price: Professional Net Price: $135.00

AUDIO-TECHNICA U.S., INC.
ATM-31
33 Shiawassee Avenue, Fairlawn, OH 44313
(216) 836-0246
Contact: Charlie Winkler, Mktg. Mgr. Music Products.
Date Product Introduced: January 1979.
Product Description: Uni-directional, fixed charge condenser vocal microphone. Features new rear electret principle and triple mesh, completely soldered windscreen. Unit comes in vinyl carrying case with stand clamp.
Recommended Usages: Vocals, acoustic guitar, brass, flute.
Specifications: Frequency Response: 60 - 20,000 Hz.
Sensitivity: – 55 dBm.
Impedance: 600 ohms balanced.
Battery: 1.5V AA Penlight.
Suggested List Price: Professional Net Price: $110.00

Audio-Technica, U.S. Inc.
Model ATM-41

AUDIO-TECHNICA U.S., INC.
ATM-41
33 Shiawassee Ave., Fairlawn, OH 44313
(216) 836-0246
Contact: Charlie Winkler, Mktg. Mgr. Music Products.
Date Product Introduced: January 1979.
Product Description: Uni-directional, dynamic, vocal microphone. Features shock mounted capsule and triple mesh, completely soldered windscreen. Units come in vinyl carrying case with stand clamp.
Recommended Usages: Vocals, Leslie, amplified instruments.
Specifications: Frequency Response: 60 - 16,000 Hz.
Sensitivity: – 56 dBm.
Impedance: 600 ohms balanced.
Suggested List Price: $130.00

AUDIO-TECHNICA U.S., INC.
ATM-91
33 Shiawassee Avenue, Fairlawn, OH 44313
(216) 836-0246
Contact: Charlie Winkler, Mktg. Mgr. Music Products.
Date Product Introduced: January 1979.
Product Description: Uni-directional, fixed charge condenser vocal microphone. Features shock mounted capsule and triple mesh, completely soldered grille screen. Unit comes in vinyl carrying case with stand clamp.
Recommended Usages: Vocals, reeds, flute.
Specifications: Frequency Response: 70 - 20,000 Hz.
Sensitivity: – 56 dBm.
Impedance: 600 ohms balanced.
Suggested List Price: $135.00

CERWIN-VEGA
CERWIN-VEGA UD-1 MICROPHONE
12250 Montaque Street, Arleta, CA 91331
(213) 896-0777
Contact: Michael Koehn, Public Relations
Date Product Introduced: January 1979.
Product Description: Cerwin-Vega's UD-1 is a cardioid dynamic microphone. The dome of the diaphragm has a very high stiffness to weight ratio, through the use of metallic molecular disposition and aluminum voice coil wire. Special adhesives and suspension allow extended response and reduced diaphragm break-up at high sound levels. The UD-1 also features a uniform directivity pattern over the entire useable frequency range.
Recommended Usages: The UD-1 is an ideal vocal microphone in noisy instrumental backgrounds.
Specifications: Directional Characteristics: Cardioid.
Impedance: 200 ohms/balanced.
Frequency Response: 70 Hz - 15 KHz.
Sensitivity (0 dB = 1v/1ubar): – 73 ± 3 dB.
Pop Filter: Built in.
Suggested List Price: $100.00

CERWIN-VEGA
CERWIN-VEGA UE-1 MICROPHONE
12250 Montaque Street, Arleta, CA 91331
(213) 896-0777
Contact: Michael Koehn, Public Relations.
Date Product Introduced: January 1979.
Product Description: The UE-1 is a cardioid electret condensor microphone. Distortion, even at high sound levels, and frequency response are studio quality. The mike has a 3 pin XLR connector for balanced lines, and internal switching easily converts it to high impedance. A music-voice switch provides bass rolloff for vocal miking.
Recommended Usages: The UE-1 is suitable for professional recording or reinforcement yet rugged enough for full time stage use. An excellent all purpose mike, especially suited for musical instrument miking.
Specifications: Directional characteristics: cardioid.
Impedance: 600 - 10K (dual switchable).
Frequency response: 80 Hz - 20 KHz.
Sensitivity (0dB = 1v/1ubar): – 70 ± 3 dB.
Pop Filter: Built in.
Suggested List Price: $125.00

COUNTRYMAN ASSOCIATES
EM-101 MICROPHONE
424 Stanford Ave., Redwood City, CA 94063
(415) 364-9988
Date Product Introduced: January 1979.
Product Description: The Countryman Associates Model EM-101 is an extremely compact electret condenser microphone. It's unusually small diaphram (.15" x .25") contributes to it's excellent transparency and flat frequency response which approaches that of a laboratory microphone.
Recommended Usages: While the EM-101 can be used in any application which would benefit from it's lack of coloration, it is especially well suited for pickup of acoustic instruments where it's small size allows inconspicuous mounting on the instrument itself and its high sound level capability provides undistorted output from even the loudest instrument. The EM-101 is an excellent alternative to vibration and acceleration type pickups where it can often provide improved performance at lower cost.
Specifications: Pickup Pattern: Omnidirectional.
Frequency Response: ± – 2 dB 20 to 15,000 Hz.
Noise Level: 27 dB SPL A-Weighted.
Max. Sound Level: 145 dB SPL.
Power Requirements: 48V Phantom Power or 9V Battery.
Output Impedance: 150 Ohms, Balanced.
Dimensions: .6" x .3" x .15".

Mics & Pickups

EDCOR/CALREC
CALREC
16782 Hale Ave., Irvine, CA 92714
(714) 556-2740, (800) 854-0259
Contact: Wayne Wyche, Marketing Manager
Date Product Introduced: March 1979.
Product Description: Three new gooseneck capacitor condenser microphones console powered. CM-10 at 14 inches, CM-11 at 4 inches, CM-12 at flush table mounting level.
Recommended Usages: Recommended for critical sound reinforcement applications for conference tables.
Specifications: Frequency Response of 30 - 20,000 Hz ± 1.5 dB.
Suggested List Price: $340., $310., $300. respectively.

EDCOR
E-COM WIRELESS
16782 Hale Avenue, Irvine, CA 92714
(714) 556-2740, (800) 854-0259
Contact: Wayne Wyche, Marketing Manager.
Date Product Introduced: March 1, 1979.
Product Description: In the 150-210 mHz business band, Edcor releases two new transmitters and three new receivers. E-Com 1 pocket transmitter. E-Com 2 Microphone handheld transmitter. E-Com 3 single channel crystal controlled receiver. E-Com 5 true two channel diversity receiver for two antennas. E-Com 7 portable mini receiver.
Recommended Usages: Recommended for stage performers, church ministers, guitarist (wireless), teachers, lecturers, TV and movie technicians, or anyone who has to be released for the freedom of dragging a microphone cable.
Specifications: Frequency response of 20-20,000 kHz ± 1.0dB.
Soft compressors for companding are utilized.
Drift free operation for 100 feet under the very worst RF conditions to 1000 feet line of sight, 500 feet average.
Works under any weather conditions, regardless of humidity or temperature.
Suggested List Price: Please write Edcor for list prices.

ELECTRO-VOICE, INC.
DO56 PROFESSIONAL DYNAMIC OMNIDIRECTIONAL MICROPHONE
600 Cecil St., Bucanan, MI 49107
(616) 695-6831
Contact: Greg Silsby, Mktg. Mgr., Pro Audio Products.
Date Product Introduced: March 1979.
Product Description: Shock-mounted microphone which eliminates handling noise and cord vibration. Main acoustic cavity and the diaphragm/voice-coil assembly are isolated as a unit from the case. Capsule/collision is impossible. "G-factor" margin makes the DO56 less susceptible to bell-like clang when accelerated or decelerated rapidly. Acoustifoam® blast filter included to reduce "P-pops". Silver tone beige finish plus a Memraflex grille to resist dents.
Recommended Usages: Recommended for hand-held broadcast and sound reinforcement applications. Excellent vocal qualities without low-frequency noise interference.
Specifications: Frequency Response: 80 - 18,000 Hz.
Impedance: 150 ohms.
Output: – 61 dB.
Suggested List Price: Not yet available.

ELECTRO-VOICE, INC.
RE18 PROFESSIONAL DYNAMIC CARDIOID MICROPHONE
600 Cecil St., Buchanan, MI 49107
(616) 695-6831
Contact: Greg Silsby, Mktg Mgr, Pro Audio Products.
Date Product Introduced: March 1979.
Product Description: Equipped with integral shock mount which reduces handling and cord noise, refined blast filter to eliminate "P-pops", and a "hum-buck" coil to reject hum noise. Variable-D design provides uniform frequency response at all angles and eliminates bass-boosting proximity effect. Silver tone beige finish plus a Memraflex grille to resist dents.
Recommended Usages: Ideal for applications where ambient noise rejection is mandatory. May be hand-held or used with stand, and its attractive styling is perfect for video usage.
Specifications: Frequency Response: 80 - 15,000 Hz.
Impedance: 150 ohms.
Output: – 57 dB.
Suggested List Price: Not yet available.

GOTHAM AUDIO CORP. (N. AMERICAN DISTRIBUTORS)
NEUMANN U-89 CONDENSER MICROPHONE
741 Washington St., New York, NY 10014
(212) 741-7411
Contact: Eli Passin, Vice President.
Date Product Introduced: March 1979.
Product Description: Similar in shape but smaller than the famous U-87, the U-89 is a 5 pattern switchable microphone utilizing a newly developed dual-membrane condenser capsule which is elastically suspended to prevent mechanical shock transmission. The 5 switchable patterns are: omni, wide-angle cardioid, standard cardioid, hyper-cardioid, and figure 8. The newly developed amplifier allows sound pressure levels of up to 134dB without distortion. With a rotary — 6dB switch engaged, the SPL can go up to 140dB. A high pass switchable filter provides roll off at either 80 Hz or 160 Hz for cancelling noise in this range. Flat frequency response is maintained by utilizing the proximity effect.
Recommended Usages: This microphone is the most versatile in the Neumann line. It can be used close-up for soloists, at medium distances for groups, or larger distances for complete symphony orchestras.
Specifications: Acoustic operating principle: Pressure gradient transducer.
Polar patterns: Omni, wide-angle cardioid, cardioid, hypercardioid, figure 8.
Frequency range: 40hz to 18,000Hz.
Sensitivity: 8mV/Pa + 1dB.
Source impedance: 150 ohms.
Minimum load impedance: 1,000 ohms.
S/N ratio according to DIN 45590 (ref. level 1 Pa) ►/= 70dB.
Max. SPL for 0.5% THD at 1KHz 134dB; with pre-attenuation 140dB.
Power Supply: 48V ± 6V (Phantom Powering)
Current consumption 0.7mA.
Weight 400g (14 oz.).
Dimensions: Diameter: 46mm (1.8 in) Length: 185mm (7.3 in).
Suggested List Price: $1,095.00 including swivel, cable.

NADY SYSTEMS
VHF SYSTEM
1145 65th St., Oakland, CA 94608
(415) 652-2411
Contact: Pete Kalmen, Sales; Bryon Stone, Marketing.
Date Product Introduced: March 1979.
Product Description: The Nady VHF System includes a VHF diversity receiver and a wireless transmitter for microphone or instrument set at a VHF frequency (150 - 22 OmHz) designated by the user. The system features the same famous "Nasty Lo-Noise" patent-pending circuitry as the company's other systems developed for similar use, which allows for unprecendented, quiet 99 dB (or better) signal to noise ratio transmission, with a minimum range of 250 feet.
Recommended Usages: The system is designed for use in particular settings where wireless transmission of sound, through microphone or instrument, is either necessary or preferable to using a standard cord. The microphone transmitter may be used with any professional microphone of the user's choise, while the instrument transmitter may be used with any electrical instrument or acoustic, wind or horn instument with an appropriate pickup.
Specifications: Frequency Response: 20 - 20,000 Hz, ± 3 dB.
Signal to Noise ratio: better than 99 dB.
Total Harmonic Distortion: Less than 0.7%.
RF Carrier Frequency: 150 to 220 MHz standard — customer to specify.
Modulation: 15 KHz.
Range: in excess of 250 feet.

SENNHEISER ELECTRONIC CORPORATION (NY)
POWERING MODULE, MODEL K3U
10 West 37th St., New York, NY 10018
(212) 239-0190
Contact: Cornelis Hofman, Vice President Marketing
Date Product Introduced: October 1978.
Product Description: K3U, power supply. The power supply contains 5.6 volt battery with a life expectancy of 5 to 600 hours. Can be phantom powered from external power supplies with voltages between 12 and 48 volts. Unit contains built-in low frequency cut-off filter to reduce wind and environmental noises. No. 1 position is flat; No. 2 position gives a minus 7 dB at 100 Hz; No. 3 position minus 20 dB at 50 Hz.
Recommended Usages: Might be used together with the ME 20, ME 40, ME 80, ME88 and MKE 10-3 electret microphones.
Suggested List Price: K3U lists for $135.00

SENNHEISER ELECTRONIC CORPORATION (NY)
SPOT MICROPHONE HEAD, MODEL ME 88
10 West 37th St., New York, NY 10018
(212) 239-0190
Contact: Cornelis Hofman, Vice President Marketing
Date Product Introduced: December 1978.
Product Description: ME 88 spot microphone head. Extreme light weight highly directional shotgun microphone (less than 2 oz.) attaches to the K3U powering module.
Recommended Usages: Specially suitable for isolated pickups, soloists and for location recordings.
Specifications: Frequency Response: 50 to 15,000 Hz.
Output Impedance: 200 ohms.
Dimensions: 22 inches.
Suggested List Price: $234.00

SENNHEISER ELECTRONIC CORPORATION (NY)
TIE CLIP MICROPHONE HEAD, MODEL MKE 10-3
10 West 37th St., New York, NY 10018
(212) 239-0190
Contact: Cornelis Hofman, Vice President Marketing
Date Product Introduced: December 1978.
Product Description: MKE 10-3. Full frequency range between 50 to 20,000 Hz; miniature lavalier microphone with 10 ft. lg. stranded stainless steel cable ending in a connector to hook up the microphone to the K3U powering module.
Recommended Usages: Interviews, piano and drum recordings.
Specifications: Omnidirectional microphone.
Frequency Response between 50 and 20,000 Hz.
Balanced 200 ohm microphone in connection with the K3U powering module.
Finish: flat black chromed solid brass.
Suggested List Price: $150.00

SONY INDUSTRIES
C-38B PROFESSIONAL MICROPHONE
9 West 57th St., New York, N.Y. 10019
(212) 371-5800
Contact: David Cooper, Account Executive
Date Product Introduced: 1978
Product Description: Professional condenser microphone with switchable omni-directional or uni-directional characteristics, internal battery or phantom power.
Recommended Usages: Excellent all-purpose microphone for professional use in recording studios and broadcast, theater stage sound systems, wherever circumstances demand a combination of good performance, versatility of operational mode, and simplicity of microphone set-up.
Specifications: Frequency response 30 - 16,000 Hz.
Output Impedance 250 ohms.
Signal to Noise ratio: 70 dB.
Maximum Sound Pressure: 140 dB.
Dynamic Range: 116 dB.
Equalizer M, M1, V1, V2.
Mic Connector: fixed.
Dimensions: Max dia. 3", length 8 1/16".
Weight 1 lb. 7 oz.
Suggested List Price: $550.00

SONY INDUSTRIES
C-47 PROFESSIONAL MICROPHONE
9 West 57th St., New York, NY 10019
Contact: David Cooper, Account Executive.
Date Product Introduced: 1978.
Product Description: Probably one of the best microphones available. It's a professional condenser mic with switchable omni-directional or uni-directional characteristics. It gives faithful response with exceedingly low distortion and exceptional transient clarity even at the highest sound pressure levels. Numerous improvements in the circuit design insures continuous reliable performance.
Recommended Usages: Designed expressly for critical recording situations.
Specifications: Frequency Response: 30 - 18,000 Hz.
Output Impedance: 50 ohms.
Signal to Noise Ratio: 70 dB.
Maximum Sound Pressure Level: 154 dB.
Dynamic Range: 130 dB.
Equalizer: M1, M2, V1, V2.
Mic connecter fixed.
Weight: 1 lb. 1 oz.
Dimensions: Max. dia. 2 1/16", length 7 7/8".
Suggested List Price: $1,050.00

SONY INDUSTRIES
ECM-65F
9 West 57th St., New York, N.Y. 10019
(212) 371-5800
Contact: David Cooper, Account Executive.
Date Product Introduced: 1978.
Product Description: hand held professional electret condenser microphone specifically designed for vocal use. It is a unidirectional microphone of Back Electret design which delivers superior sound and gives superb performance when used for singing or speaking voice. It has a unique double wind screen to greatly reduce pop noises and minimize effects encountered during outdoor use. It can be powered with a Phantom System or batteries.
Recommended Usages: Professional use for vocal recordings, indoor or outdoor.
Specifications: Capsule Type: Back Electret Condenser.
Directivity: Uni.
Frequency Response Hz.: 70 - 20,000.
Output Impedance: 250 ohms.
Open Circuit Output Level: – 54 dB; 0 dB = 1V/10 ubar at 1 KHz: 2.0 mV.
Signal to Noise Ratio 1 KHz 10 ubar: 66 dB.

Mics & Pickups

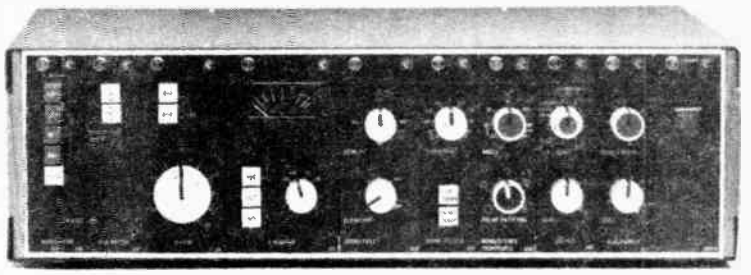
Maximum Sound Pressure, Level SPL: 137 dB.
Dynamic Range: 109 dB.
Mic Connector: XZLR-3 type.
Mic Cable Length: 20 ft.
Cable Plug Type: XLR-3 type.
Power Supply: Phantom, Battery, Eveready E177.
Dimensions: Max, dia. 1½", length 7".
Weight: 7.5 oz.
Supplied Accessories: carrying case, mic holder, mic cable.
Suggested List Price: $235.00

SONY INDUSTRIES
F-115 PROFESSIONAL MICROPHONE
9 West 57th Street, New York, N.Y. 10019
(212) 371-5800
Contact: David Cooper, Account Executive.
Date Product Introduced: 1978.
Product Description: Omni-directional dynamic microphone for outdoor use in all weather conditions. It has a built in waterproof screen that keeps rain, condensation and dust out. Special packing inside the mic capsule assures unfouled connections. To keep microphone touch noise to a minimum, the F-115 has a vibration proof rubber mounting.
Recommended Usages: Outdoor use in all weather conditions.
Specifications: Capsule type: dynamic.
Directivity: omni.
Frequency Response Hz: 40 - 12,000
Output Impedance: 600 ohms.
Open circuit Output Level OdB = 1V/10 ubar at 1 KHz: −54 dB, 2.0 mV.
Mic Connector: Fixed.
Mic Cable Length: 20 ft.
Cable Plug Type: XLR-3 type
Dimensions — max. dia.: 1 7/16", length 6 7/8".
Weight: 9.5 oz.
Supplied Accessories: Carrying bay, wind screen, mic holder.
Suggested List Price: $150.00

SONY INDUSTRIES
F-660 PROFESSIONAL MICROPHONE
9 West 57th St., New York, N.Y. 10019
Contact: David Cooper, Account Executive.
Date Product Introduced: 1978.
Product Description: Uni-directional dynamic microphone for vocal/orchestral recording. The Sony F-660 offers extended bass response, and smooth transience through the frequency range for a clean top end. It reduces distortion and minimizes feedback. A safety lock mechanism helps prevent loose cable contact and accidental disconnection. Combined with a vibration free structure, the F-660 is ideal for vocalists who move a great deal.
Recommended Usages: The uni-directional design makes it perfect for use wherever there is a need to isolate one sound source from others surrounding it. It also is good for PA use. Designed for vocal/orchestral recording.
Specifications: Capsule type: dynamic.
Directivity: uni.
Frequency Response Hz: 100 - 10,000.
Output Impedance: 250 ohms.
Open Circuit Output Level 0 dB = 1V/10 ubar at 1 KHz: −58 dB, 1.2 mV.
Mic Connector: XLR-3 type.
Dimensions: Max. dia. 1½", length 6½".
Weight: 6.4 oz.
Supplied Accessories: Mic holder.
Suggested List Price: $250.00

The Mix CLOSE-UP

The Calrec Sound Field Studio System

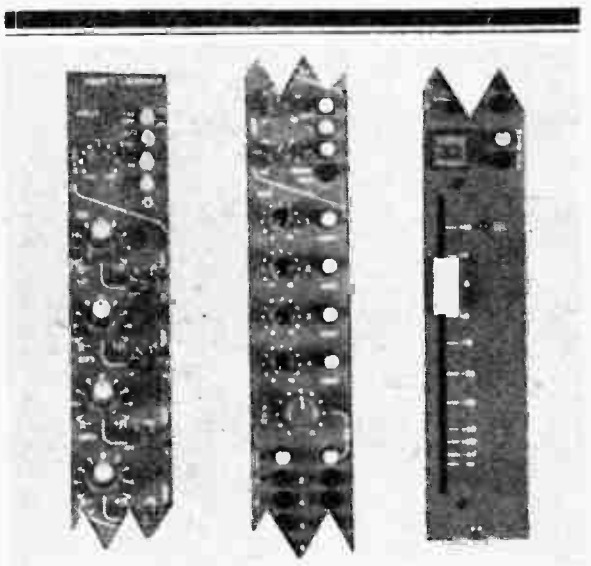


The Calrec Sound Field Microphone Type CM4050 enables the effective polar pattern of the microphone, as well as it's direction of pointing both in pan and tilt, to be adjusted not only remotely at a live recording session but also by post session processing of the master tape. In addition, the microphone provides the effect of a stereo pair (or greater number) of microphones that are strictly coincident over most of the audio spectrum.

The microphone set consists of two main components: the Sound Field Microphone CM4050, and the Sound Field Control Unit CS5014/3. The Microphone Type CM4050 consists of a closely spaced array of capacitor capsules in the form of a regular tetrahedron within a single housing, and having head-amplifier circuitry incorporated in the stem in the usual way.

The Sound Field Control Unit Type CS5014/3 receives A-Format signals from the head amplifiers via a multicore cable, and by means of special circuitry converts these to four equalised signals at Line Level for the normal range of programme level reaching the Microphone. These four signals, known as B-Format, are proportional respectively to the three orthogonal components of pressure-gradient, namely left-minus-right, front-minus-back, and up-minus-down. These signals are suitable for direct recording, or can be subject to further processing or encoding in the Sound Field Control Unit.

Mixing Consoles



Amek Model 1000A
Input Module

AMEK SYSTEMS AND CONTROLS LIMITED
C/O EVERYTING AUDIO
AMEK 1000-A
16055 Ventura Blvd., Suite 1001, Encino, CA 91436
(213) 995-4175
Contact: Brian Cornfield, Pres., Everything Audio
Date Product Introduced: Mid 1979.
Product Description: AMEK M1000 is a 10 buss console intended for concert sound reinforcement work under the most exacting conditions. The electronics are similar to those used in the M3000 studio console, as is the general finish and appearance, but the actual facilities are more in line with sound reinforcement requirements. The standard mainframe is prewired for 32 inputs, and 8 subgroups mixing to a stereo output. A suitable jackfield will be included, mounting in the rear of the mixer.
Recommended Usages: Professional concert sound reinforcement systems that require automation assistance.
Specifications: Maximum level in (line): + 24.78 dB.
Maximum level in (mic): + 22 dBv.
Maximum level out (line: + 23.5 dBv.
Slope .8 volts per microsecond.
Maximum EQ boost and cut: ± 15 dB.
Maximum EQ slope: 30 dB/octave.
Minimum EQ slope: 3/4 dB/octave.
Suggested List Price: $31,000.00

AMEK SYSTEMS AND CONTROLS LIMITED
C/O EVERYTHING AUDIO
AMEK M-2000 A
16055 Ventura Blvd., Suite 1002, Encino, CA 91436
(213) 995-4175
Contact: Brian Cornfield, Pres. Everything Audio
Date Product Introduced: Mid 1979.
Product Description: AMEK M2000A is a sophisticated, low cost VCA-fader recording console. The M2000A combines the functionalism of the existing M2000 with the benefits gained from the production of the M3000 automation-ready console. The M2000A will have a standard format of 28/16 + 24 with additional direct asigns from channels 17 - 24. The console will be supplied with comprehensive patchfield and power supplies, including phantom (+ 48V) rail. Penny and Giles conductive plastic faders and Sifam moving-coil meters will be used throughout.
Recommended Usages: Professional tracking and mixdown of audio for all types of media where automation and quality must be realized and their effects maximized.
Specifications: Maximum level in (line): + 24.78 dB.
Maximum level in (mic): + 22 dBv.
Maximum lever out (line): + 23.5 dBv.
Slope: 8 volts per microsecond.
Maximum EQ boost and cut: + / – 15 dB.
Maximum EQ slope: 30 dB/Octave.
Minimum EQ slope: 3/4 dB octave.
Suggested List Price: $41,000.00

APPLIED TECHNOLOGY INC.
SPECTRA SOUND 1500-B PRODUCTION MIXER
2245 South West Temple, Salt Lake City, UT 84115
(801) 467-2842
Date Product Introduced: 5/1/1979.
Product Description: The 1500-B is a production mixer designed specifically for disco or production application. The unit features digital operated cue/program functions. The 1500-B has two phono and line level inputs. Metering is accomplished in both cue and output stages of the board via LED read-outs. Signal equalization is controlled on program output, talk-over, and headphone monitor.
Recommended Usages: Any professional installation requiring low noise, high slew, and low distortion.
Specifications: THD .008
IM .008 at + 4 dBm.
Slew Rate 13 volts/microsecond.
Signal/Noise, aux: – 100 dBm; Phono: – 85 dBm at 10 mv referenced at + 4 dBm.
Suggested List Price: $995.00

AUDIO MARKETING LTD.
AUDIOKIT 62
652 Glenbrook Rd., Stamford, CT 06906
(203) 359-2312
Contact: Richard N. Anderson, Vice President.
Date Product Introduced: February 1979.
Product Description: The AudioKit 62 is a professional quality kit mixer, that can be built in a matter of hours with a few basic tools. Each of the 6 mic or line inputs has gain adj., hi and lo EQ, cue and echo send, panning and linear faders. The two output channels have aux. returns and VU meters. The unit can be operated from the AC supply or a battery pack.
Recommended Usages: The AudioKit can be used for live recording, PA mixing, small studio recording, disco mixing (with the phono option) or any auxillary mixing function where size is important.
Specifications: Sensitivity: Variable from – 60 dBm.
Channel EQ: ± 16 dB at 80 hz and 16 KHz.
Main OP: 0 dBm at less than 600 ohms.
Echo/Cue OP: – 20 dBm into 10K ohms.
Max OP: + 20 dBm.
Distortion: Less than 0.1% at normal OP.
Aux IP: – 10 dBm at 15K ohms.
OP Noise: Less than – 65 dBm, UNWTD.
Crosstalk: Less than – 60 dB at 1 KHz.
Supply Rgt: + 24 VDC at 40mA.
Connectors: DIN power, jacks for audio.
Color: Light and dark brown, legend black.
Dimensions: 320 x 405 x 40 mm, less knobs.
Suggested List Price: AudioKit (KIT) w/P.S. $265.00.
AudioKit (ASSM) w/P.S. $395.00

CERWIN-VEGA
MX-8 MIXING CONSOLE
12250 Montaque St., Arleta, CA 91331
(213) 896-0777
Contact: Michael Koehn, Public Relations.
Date Product Introduced: January 1979.
Product Description: The MX-8 is an eight channel mixing board. Each input channel will accomodate a mike or line-level signal via balanced XLR or 1/4" phone connectors. An all-electronic analog delay circuit provides pro-quality reverb, and BIFET IC's yield studio quality noise and distortion. Stereo program and monitor outputs will drive balanced and unbalanced loads simultaneously. Rear-panel jacks allow access to all buss lines and individual channels.
Recommended Usages: Due to its rugged construction, the MX-8 is ideal for portable or fixed PA and musical groups. Its performance and expansion capabilities will also be of interest to professional recording and sound reinforcement concerns.
Specifications: Maximum output: + 18 dBv.
THD: Typicall .05%.
Noise: – 125 dB "A" equivalent input noise.
Fq. turnover frequencies 100 Hz, 2.5 KHz, 10 KHz.
Lo filter frequencies: Continuously variable 20 - 200 Hz.
Individual input controls: channel fader, L-R pan, monitor send, reverb, lo eq., mid eq., hi eq., attenuator w/clip LED.
Suggested List Price: Available in April.

EV-Tapco
Model C-12 Console

EV—TAPCO
C-12
3810 148th N.E., Redmond, Wn. 98052
(206) 883-3510
Contact: See your Tapco advanced products dealer.
Date Product Introduced: January 1979.
Product Description: A unique mixing console designed for both sound reinforcement and recording. Features include: 12 x 4 x 2 x 1 in/out format, stereo/mono sub-groups 4 knob, sweep mid-range EQ on each channel, complete solo functions on all sends with headphone priority, powerful headphone amp, + 48 phantom power, extensive patching/routing facilities with front panel patch bay, transformer balanced inputs, switchable metering, plus unit compatible with + 4 and – 10 dB tape machines.
Recommended Usages: Designed for all types of sound reinforcement and smaller format multi-track recording requiring a

sophisticated mixing console.
Specifications: Frequency Response: Mic — 20 - 20 KHz ± 1dB, Line— 20 - 20 KHz ± .5dB.
CCIF IM Distortion: .02% (19 - 20 KHz mixer 1:1, + 4dBm output).
Equivalent Input Noise: – 128 dBv.
Output Noise: – 80 dBv.
Suggested List Price: $1979.00

EV-Tapco
Model 8201B Console

EV—TAPCO
8201B
3810 148th N.E., Redmond, Wn. 98052
(206) 883-3510
Contact: J. Michka, Staff Writer.
Date Product Introduced: December 1978.
Product Description: The 8201B is an 8 channel stereo output mixer with features including: pre-everything monitor send, + 48v phantom power, differential Autopad® on all input channels, switchable Vu meters, advanced chassis design, complete stackability with another 8201B or 8201REB expander system. Fully rack mountable: 12¼" x 19".
Recommended Usages: The 8201B is suitable for table-top or rack mount PA and recording work. The 8201B is designed for studio or stage with a special chassis design for easy use and proper connector clearance.
Specifications: Frequency Response: 20 - 20 KHz ± 1dB.
THD: Less than .05%.
SMPTE IM Distortion: .05% at + 4dBm less than .05% at + 18dBm.
Equivalent Input Noise: – 127dBv.
Suggested List Price: $750.00

FENDER MUSICAL INSTRUMENTS
M-12
1300 E. Valencia Blvd., Fullerton, CA 92631
(714) 879-8080
Contact: Denny Handa, Dir. Marketing Dept.
Date Product Introduced: January 1979.
Product Description: M-12 Mixer. 12 input and 4 output channels. Two fully assignable submasters and 4 masters. Six fast attack, slow release limiters, one for each submaster and four output busses. Each limiter has variable threshold control and indicator LED. Full talkback and cueing. Individual channel looping. Comprehensive in/out interface allows input of any line-level source from tape recorders to effects. 5-band EQ on 4 masters. Peak indicating VU meters, calibrated in dB's.
Recommended Usages: Live sound reinforcement, live recording, creative audio studio recording.
Specifications: Weight: 65 lbs includes full cabinet.
Size: 31"W, 27'D, 7"H.
Frequency Response: + 0, – 4dB, 20 Hz to 20 KHz - + 0, – 1.5 dB, 35 Hz to 20 KHz.
THD: Less than 0.1%, 40 Hz to 20 KHz.
EQ: ± 15dB typical at 100 Hz, Shelving: ± 15dB typical at 10KHz, shelving.
Hum & Noise: 128 dBm maximum equivalent input noise (150 ohm) source, 600 ohms load, maximum gain). – 80dBm master fader at minimum – 70 dBm master fader at – 10 (all input at – 10 with gain set to mid position).
Suggested List Price: $3100.00

HARRISON SYSTEMS, INC.
ALIVE — LIVE PERFORMANCE CONSOLE
P.O. Box 22964, Nashville, TN 37202
(615) 834-1184
Contact: Tom Piper, V.P. or Dave Purple, Sales
Date Product Introduced: November 1978
Product Description: The first programmable console designed for live performance. Standard features include Harrison

Mixing Consoles

transformerless microphone preamps, automated VCA faders with groupers, 8 VCA matrix sub groups, direct communications interface, 4 main stereo output pairs, 8 auxilliary send busses, 8 built-in 16 segment electronic LED VU meters, 32 or 24 channel mainframes and extender frames, and 3 point overload LED indicator on each I/O module.

INTERFACE ELECTRONICS
SOUND SYSTEM MIXERS MODEL 16T8A & B
3810 Westheimer, Houston, TX 77027
(713) 626-1190
Contact: Louis Stevenson, President.
Date Product Introduced: February 1979.
Product Description: New Interface mixers Series 308 Model 16T8A and 16T8B provide 16 (or more) inputs to 8 submixes with a pot matrix to 8 outputs. In the 16T8A, the main output masters are sliders, while in the 16T8B the submix masters are sliders. Input modules provide phantom power, phase reverse, solo, pan, 4 cue/effects sends, gain switch and gain trim, low cutoff, long travel slider, three equalizers. In the 308B the three equalizers are parametric, with 15 dB symmetrical boost/cut, variable width .1 to 2 octaves and tuneable 150 to 15,000 Hz. Many output options are also available.
Recommended Usages: These new Series 308 mixers are recommended for sound systems of all kinds and for recording up to 8 tracks: submixes are used for performer grouping with submaster for the group, and output mixes may go to different places. Also available in 16 track.
Specifications: All Interface mixers meet the highest standards of performance as well as ruggedness and reliability. Typical
Suggested List Price: Typical 1979 prices: 17T8A or B with 308B modules $13,890.00; with 308B modules $16,290.00.

INTERFACE ELECTRONICS
STAGE MONITOR (REDESIGNED)
3810 Westheimer, Houston, TX 77027
(713) 626-1190
Contact: Louis Stevenson, President.
Date Product Introduced: February 1979.
Product Description: New Stage Monitors provide matrix mixing from 16 to 48 inputs into 8 independent output mixes and now include solo to local operator monitor and tuneable mid equalizer and four position low cutoff. Equalizers can be switched in or out on each send. Output section options include local operator's monitor which can listen to any mix or any input solo, graphic or parametric equalizers, crossovers, intercom, and talkback.
Recommended Usages: Interface Stage Monitors are used by many of the leading rock sound companies for their stage monitor mixers, which means making special mixes to feed back to musicians on stage.
Specifications: All Interface mixers meet the highest standards of performance as well as ruggedness and reliability.
Suggested List Price: Typical 1979 prices: 16 inputs $8040.00; 24 inputs $11,060.00; 32 inputs $14,380.00.

MCI, INC.
JH-556C SERIES CONSOLES, JH-500C SERIES CONSOLES
4007 N.E. 6th Ave., Fort Lauderdale, Florida 33334
(305) 566-2853
Contact: MCI, Inc. Marketing Dept. or local MCI dealer.
Date Product Introduced: December 1978.
Product Description: Recording/Remixing Consoles: In-line console each I/O module contains one complete mike channel and one complete remix channel. Two stereo cue systems are provided. Completely automation ready. System controls and VCAs are already installed. The JH-50 Automation can be installed before shipment, or at any later date in your facility; plus many other MCI, Inc. standard features.
Recommended Usages: Recording studios.
Specifications and Suggested List Price: We invite you to visit our Booth Nbrs. 83, 84 & 85 at the AES Convention/Los Angeles. For detailed specifications and pricing information.

MCI, INC.
JH-600 SERIES CONSOLES
4007 N.E. 6th Ave., Fort Lauderdale, Florida 33334
(305) 566-2853
Contact: MCI, Inc. Marketing Dept. or local MCI dealer.
Date Product Introduced: November 1978.
Product Description: Recording/Remixing Console: In-line console with each I/O module containing one complete mike channel and one complete remix channel. Differential line inputs, differential mike preamps. 24 channel busses with panning. Standard JH-50 Automation which provides such advantages as discrete grouping and Stereo In Place Solo, plus many other MCI, Inc., standard features.
Recommended Usages: Recording studios, broadcast applications.
Specifications and Suggested List Price: We invite you to visit our Booth Nbrs, 83, 84 & 85 at the AES Convention/Los Angeles, for detailed specifications and pricing information.

OPAMP LABS, INC.
MODEL 1204 TV
1033 North Sycamore Ave., Los Angeles, CA90038
Contact: Bel Losmandy.
Date Product Introduced: Updated July 1978.
Product Description: Production console that can be used for radio and TV. Sold as kit or wired. 12 input, 4 output console. Four distribution amps with four outputs each, one echo buss and submixes for mixer monitor, slate mic, director monitor, and boom monitor.
Specifications: Input noise – 127 dBm.
Output level + 24 dBm.
Signal to noise 70 dB.
Mix pot, cue switch, input select and echo send per input channel.
Included are internal power amps for mix monitor, boom feed, director monitor, aux. monitor, distribution amps and cue. Five-freq. test oscillator, cue on all input channels and cue speaker. In stock.
Suggested List Price: $9,442.30

PYRAMID AUDIO MANUFACTURING
PYRAMID SERIES C RECORDING CONSOLE
617 Stendhal Lane, San Jose, CA 95129
Contact: Steve Runner, V.P.
Date Product Introduced: January 1979.
Product Description: The series C is a high performance audio mixing console featuring a four band EQ, HP and LP filters, FET mode switching, and is automation ready. Configurations are from 16 in, 16 out, to 40 in , 32 out. Additionally, this unit boasts 4 independently controlled reverb sends, odd-even panning, 32 segment LED VU meters and VCA monitor sends for group mixing.
Recommended Usages: The basic series C system is designed for use in high performance music recording studios. Modifications for sound reinforcement are available.
Specifications: Frequency Response: 30 - 20,000 Hz ± 1 dB.
Distortion: 0.25% 30 - 20,000 Hz at + 27 dBm out.
Equivalent Input Noise: 127 dBm, 20 - 20,000 Hz, unwtd.
Maximum Output: + 27 dBm.
Crosstalk: – 75 dB at 1 KHz.
Suggested List Price: 16 in, 16 out: $25,000.00
28 in, 24 out: $39,000.00
32 in, 32 out: $48,000.00

PYRAMID AUDIO MANUFACTURING
PYRAMID SERIES D RECORDING CONSOLE
617 Stendhal Lane, San Jose, CA 95129
Contact: Steve Runner, V.P.
Date Product Introduced: January 1979.
Product Description: The new Pyramid Audio Series D audio mixing console is ideally suited for studios wishing a full function unit convertible to automation at a later date. Features include a nine position graphic equalizer, HP/LP filter, FET mode switching, 4 reverb sends, odd-even panning, and 16 segment LED metering. Series D is available from 16 in 16 out to 32 in 32 out.
Recommended Usages: The basic series D system is designed for use in high performance music recording studios. Modifications for sound reinforcement are available.
Specifications: Frequency Response: 30 - 20,000 Hz ± 1 dB.
Distortion: 0.25% 30 - 20,000 Hz at + 27 dBm out.
Equivalent Input Noise: – 127 dBm, 20 - 20,000 Hz, unwtd.
Maximum Output: + 27 dBm.
Crosstalk: – 75 dB at 1 KHz.
Suggested List Price: 16 in 16 out: $17,800.00
32 in 32 out: $35,600.00

Mixing Consoles

QUANTUM AUDIO LABS, INC.
QM-8P BROADCAST PRODUCTION CONSOLE
1905 Riverside Dr., Glendale, CA 91201
(213) 841-0970
Contact: Carol Pope
Date Product Introduced: October 1978.
Product Description: The QM-8P is an 8 channel dual stereo board. Each channel has a complete 3 knob equalizer, headphone send, panning circuitry (balance on stereo inputs), echo and headphone sends channel on switch with muting and a cue detent on the conductive plastic faders. Four separate systems allow the ultimate in monitoring flexibility, balanced inputs and outputs, true VU meters, separate high reliability masters for the program and audition channels provide maximum flexibility.
Recommended Usages: This console finds applications anywhere a broadcast oriented studio is desired. Ideal for production studios with a demand for high performance at a minimum cost. Applications will also include post production film studios, TV mixing panels, on the air and regular small recording studios with 4 track capability.
Specifications: Inputs: up to 20 inputs, mic and line.
Mic Input: −60 dB nominal transformer balanced with 95 dB gain to output.
Mono & Stereo line input: −10 dB to +20 dB +4 dB nominal balanced bridging.
Outputs: 4 buss (dual stereo) 4 monitor and 2 foldback nominal +8 dBm on busses, +4 dB otherwise.
Frequency response: 20 Hz to 20 KHz ± 1 dB (ref. 1 KHz).
Noise: 127 dBm E.I.N. mic, 84 dB signal to noise from +22 dBm.
Distortion 0.25% THD at +8 dBm to +22 dBm.
Slew rate: 10V/us min.
Suggested List Price: $3900.00

QUANTUM AUDIO LABS
QM-12P BROADCAST PRODUCTION CONSOLE
1905 Riverside Dr., Glendale, CA 91201
(213) 841-0970
Contact: Carol Pope
Date Product Introduced: March 1979.
Product Description: The QM-12P is a 12 channel dual stereo board. It incorporates all the features of the QM-8P with 4 more input channels. The basic configuration is 6 stereo inputs and 6 mono inputs but may be ordered with 2, 4, 6, 8 or 10 stereo channels. Extender sections are available which expand the console to 16, 20, or 24 input channels.
Recommended Usages: The large number of inputs available and the flexibility of the outputs gives this product a unique position in the production related markets. Enough equalization is provided to allow the operator maximum creativity in making radio production and any other application where a multiple input and stereo or 4 trk. output is desired.
Specifications: 12 inputs, 4 outputs (dual stereo) with 3 extra functional busses. Expandable to 16, 20 or 24 channels.
Mic Input: −60 dB nominal, transformer balanced with 95 dB gain to the output.
Mono and Stereo line Inputs: −10 to +20 dB +4 dB nominal balanced bridging.
Outputs: 4 buss (dual stereo transformer isolated) 4 monitor and 2 foldback. Nominal +8 dBm on busses +4 dB otherwise.
Frequency Response: 20 Hz to 20K Hz ±1 dB (ref 1 KHz)
Noise: −127 dBm E.I.N. mic, 84 dB signal to noise from +22 dBm.
Distortion: 0.25% THD at +8 dBm to +22 dBm.
Slew Rate: 10 V/Us min.
Suggested List Price: $4700.00

QUANTUM AUDIO LABS, INC.
QM-168 B
1905 Riverside Dr., Glendale, CA 91201
(213) 841-0970
Contact: Carol Pope.
Date Product Introduced: May 1979.
Product Description: The QM-168B is a revolutionary new design. Its features make all other 8 buss consoles obsolete within its price range. Clever use of functional switching provide the ultimate in monitor capability as well as ease of operation. Automatic meter switching provides buss or multitack metering. Vertical sliders in the monitor section allow subgroup mixing into the stereo mix down modules without loosing the function of any input module. Available with patchbay and up to 32 inputs.
Recommended Usages: The flexibility of this console makes it a prime candidate for 8, 16, and 24 trk. recording studios, broadcast production facilities, radio and TV film scoring, fixed installation sound reinforcement and any other application where a multiple input 8 buss output console is required. Its low cost per function makes it truely desirable for most medium priced systems.
Specifications: Inputs: basic console — 16 inputs, expandable to 32 in groups of 4.
Mic: −60 dBm nominal, transformer balanced with 79 dB gain to the output.
Line Input: −10 to +20 dB +4 nominal balanced bridging.
Outputs: 8 buss plus stereo 4 effects.
Distortion: 0.1% THD 20 Hz to 20K Hz at +4 dBm to +22 dBm.
Noise: −127 dBm E.I.N. mic output noise greater than 20 dB below +4 dBm out.
Frequency Response: 20 Hz to 20K Hz ± 1dB (ref 1K Hz).
Slew Rate: 10 V/Us min.
Suggested List Price: $8,000.00 to $18,000.00

QRK ELECTRONIC PRODUCTS INC.
OMEGA AUDIO CONSOLE LINE
1568 N. Sierra Vista Ave., Fresno, CA 93703
Contact: Robert D. Sidwell, President.
Date Product Introduced: March 1979.
Product Description: Audio Console with digital switching, electronic attenuators, programmable, input level controls, programmable muting, programmable remote start... digital real time clock and elapse timer.
Recommended Usages: Broadcast, Disco, any mixing situation requiring flexible inputs of 24 or 40.
Suggested List Price: 6 channel $3795.00 10 channel $5495.00

ROAD ELECTRONICS INC.
RS 2308 PROFESSIONAL STANDARD MIXING CONSOLE
2101 East 7th St., Los Angeles, CA 90021
(213) 473-6751
Contact: Ed Swanzey, Sales Manager.
Date Product Introduced: July 1978.
Product Description: The 2308 is a completely integrated mixer offering studio quality control for any live performance situation. It features Road's exclusive Parascan tone networks, 8 input channels. Master section includes right and left stereo outputs and monitor output. 8 band graphic equalizers. Full range of controls, fully integrated system design, low noise input circuitry, 600 ohm balanced output capability.
Recommended Usages: Sound reinforcement for live performances.

ROAD ELECTRONICS
RS 2412 PROFESSIONAL STANDARD MIXING CONSOLE
2101 East 7th St., Los Angeles, CA 90021
(213) 473-6751
Contact: Ed Swanzey, Sales Manager.
Date Product Introduced: November 1978.
Product Description: The RS 2412 is a completely integrated mixer offering studio quality control in any live performance situation. It features Road's exclusive Parascan tone networks, transformerless differential input amplifiers and a power supply that maintains constant performance specs at non-stable line voltages. The 2412 also features 12 input channels, right & left stereo outputs, 8 band graphic equalizers, and a full range of controls. LED indicators show output and channel gain control. Fully integrated system design, low noise input circuitry, 600 ohm balanced output capability.
Recommended Usages: Sound reinforcement for live performance.

SONY INDUSTRIES
MX-20 MIXER
9 West 57th St., New York, N.Y. 10019
(212) 371-5800
Contact: David Cooper, Account Executive.
Date Product Introduced: 1978.
Product Description: A fully professional 8 channel microphone mixer for creating high quality studio or sophisticated amateur recordings. There are 8 channel inputs and 4 channel outputs. The MX-20 can mix and switch any input to any one of the four outputs automatically. In addition, there are "Pan Pot" and "dead center" functions. FET preamplifier insures low distortion, low noise signal. Other features include 3-position mic input attenuater to eliminate overload distortion. Balance mic input and output with XLR type connectors. Cascade connector for coupling two MX-20's to produce a 16 channel input mixer. Five-step EQ control in channels 1-6. Slide master fader for simultaneous control of all channel output and professional recording techniques such as fade in and fade out. Four VU meters.
Recommended Usages: Mixer is for high quality studio recordings.
Specifications: Input: 8 ch.
Mic in — Jack: XLR type, Impedance: low, Sensitivity: −72 dB (0.2 mV).
Line In — Jack: phono, Impedance: 100 K ohms, Sensitivity: −22 dB (60 mV).
Mic Att: off, −15 dB, −30 dB −45 dB.
Input Selector— SW: 1-both-2-3-4, Panpot: 2, (ch 7,8).
Preset Indicator: Yes.
Line Out— Jack: XLR type, phone (unbalanced); Load Impedance: Balanced, more than 600 ohms, unbalanced, more than 10 K ohms; Level: Balanced 0 dB (0.775 V), unbalanced −10 dB (o.245 V).
Headphone Out— Jack: BNL; Load Impedance: 8 ohms; Level: −24 dB (49 mV); Channel Select: 1-2, Mix, 3-4; Level Control: yes.
Preamp Out, Lineamp In: Yes (separate).
Cascade Connection: Yes.
Meter: 4.
Frequency response: 30 - 20,000 Hz +0 dB −1.5 dB.
S/N: 65 dB.
Power Requirement: AC 120 V, external DC sources, terminal of DC 48 V.
Dimensions: 18 9/16"W x 7 13/16"H x 16 3/4"D.
Weight: 23 lb 3 oz.
Suggested List Price: $1275.00

(WILLI STUDER SWITZERLAND)
STUDER REVOX AMERICA, INC.
STUDER MIXING CONSOLE 269
1819 Broadway, Nashville, Tenn 37203
(615) 329-9576
Contact: B. Hochstrasser, President
Date Product Introduced: Fall 1978.
Product Description: Mixing Console for remote or local applications in recording studios or broadcast studios. Max 17 inputs, max 4 outputs, battery or mains supply, PPM's or VU-Meters, built-in cue speaker, reverb and cue send, equalization networks. Available with stereo input modules, customized monitor-selector and signalization circuits for broadcast use. Correlator optionally available.
Recommended Usages: Recording studios (local or remote); broadcast production or continuity studios.
Suggested List Price: $14,000.00 - $16,000.00 depending on configuration.

UNI-SYNC, INC.
DISCORAMA
742 Hampshire Road, Suite A, Westlake Village, CA 91361
(805) 497-0766
Contact: Jay Simmons, Sales Manager.
Date Product Introduced: January 1979.
Product Description: Disco mixing console. Stereo board with 4 main outputs to provide 360° panorama, by using front mounted pan controls for each program group. Adjustable (26 dB) talkover, headphone & LED cue, adjustable background output for distributed system, 3-band equalizer on right and left channels of both program groups, 4 output levels are indicated by LED display. Accepts one microphone, two turntables, and two auxilliary line level inputs. Auxilliary Inputs can be switched to accept additional turntables. Any Uni-Sync input expander may be connected directly to a single connector for live mixing capabilities. 24VDC remote switching power is automatically provided in program mode.
Recommended Usages: The Discorama is a very flexible Disco Mixer that can be used with Uni-Sync input expanders to provide live mix capabilities. Sources for A & B program groups are identical. This allowing complete flexibility in fading or switching to or from any and all combinations of sources. The 24 volt remote power allows remote starting of turntables, tape decks, etc., and is controlled by the program switches.
Specifications: Mic Inputs, Impedance: 150 ohms balanced.
Sensitivity: −54 dB.
Maximum Input Level: 775V.
Inputs: Phone (2) Fixed + 2 switchable: Sensitivity 2.5 mV.
Input Impedance: 47K ohm.
Auxiliary (2): Sensitivity 250 mV, Input Impedance 47K ohm.
Outputs: +4 dBm nominal output level, +22 dBm output clipping level.
Loop/Direct Outputs: 1 volt/Low ;
Loop/Direct Inputs: 1 volt/High ;
Earphone: 8-600 hom phones, 1 watt.
Equalization: Hi-band ± 10 dB 8 KHz shelving, Mid-band +10 dB 2 KHz peak/dip, Lo-band ± 10 dB 150 Hz shelving.
Distortion: Less than .1% THD and .1% IMD.
VU Meter: 8 segment LED display.
Dimensions: Rack mountable 19"W x 14"H x 3¼"D overall. 24 lbs.
Suggested List Price: $998.00

Monitor Speakers

AMERICAN ACOUSTICS LABS
PRO SERIES BH 15
629 Cermak Rd., Chicago, Illinois 60616
(312) 243-1310
Contact: James E. Straus, Asst. Mgr., Prod. Development
Date Product Introduced: January 1979.
Product Description: The BH 15 is a horn-loaded bass-reflex enclosure. American Acoustics Labs has designed this unit with the same reliability and emphasis on performance as in all the fine speakers in the Pro Series Systems.
Recommended Usages: The BH 15 is capable of providing the booming bass which is essential for today's Disco Sounds. Ideal for small to moderate sized clubs. The BH 15 carries a five year warranty.
Specifications: 15 inch accordion surround woofer, 70 ounce magnet, 3-inch voice coil.
45 - 5,000 Hz Frequency Range.
8 ohm nominal impedance.
1/4 inch phone jack connections.
3/4 inch plywood with textured vinyl covered cabinet.
300 watts RMS program maximum power handling.
Dimensions: 36½ x 30 x 24 inches.
Suggested List Price: $500.00

AMERICAN ACOUSTICS LABS
PRO SERIES MA 14
629 W. Cermak Rd., Chicago, Illinois 60616
(312) 243-1310
Contact: James E. Straus, Asst. Mgr., Prod. Development.
Date Product Introduced: January 1979.
Product Description: American Acoustics Labs continues to be innovative in the sound reinforcement field with the introduction of the MA 14. The MA 14 with its unique design features an array of 14 piezo electric super tweeters. Encased in a sturdy vinyl covered enclosure the MA 14 is extremely portable with a handled top-latched cover.
Recommended Usages: The MA 14 is designed for use in the modular professional system. The accurate sound of the 14 piezo electric tweeters will add sizzle to the disco beat or clarity to the rock and roll highs. The MA 14 is a great additon to any system.
Specifications: Tweeter: Fourteen 3-inch solid-state piezo electric.
Frequency Range: 7,000 - 25,000 Hz.
Connections: Push terminals and 1/4 inch phone jack.
Maximum Power Handling: 250 watts RMS program.
Speaker Protection: Fused.
Dimensions: 11¼ x 30 x 11¾ inches.
Suggested List Price: $320.00

AMERICAN ACOUSTICS LABS
PRO SERIES MS 212
629 W. Cermak Rd., Chicago, Illinois 60616
(312) 243-1310
Contact: James E. Straus, Asst. Mgr., Prod. Development.
Date Product Introduced: January 1979.
Product Description: Now available from American Acoustics Labs, a deluxe floor monitor system. The MS 212 is completely portable with a vinyl enclosure and side mounted handles. The MS 212 features twin 12" drivers with a center mounted 4 x 10 horn. With a miximum power capacity of 200 watts the MS 212 is ideal for medium size rooms or halls.
Recommended Usages: The MS 212 is a floor monitor for the serious musician. The MS 212 sustains amazing clarity while cutting through the loudest backgrounds.
Specifications: Dual 12 inch accordion surround, 41 ounce magnets, 1½ inch voice coils, 4 x 10 inch compression horn with 60 watt driver — midrange.
Frequency Range: 70 - 14,000 Hz.
Impedance: 4 ohm nominal.
Crossover Point: 1,500 Hz.
Connections: 1/4 inch phone jacks.
3/4 inch plywood with textured vinyl covered cabinets.
Minimum Power Required: 30 watts RMS program.
Maximum Power Handling: 200 watts RMS program.
Dimensions: 36 x 16 x 16 inches.
Suggested List Price: $370.00

AMERICAN ACOUSTICS LABS
PRO SERIES MT 70
629 W. Cermak Rd., Chicago, Illinois 60616
(312) 243-1310
Contact: James E. Straus, Asst. Mgr., Prod. Development.
Date Product Introduced: January 1979.
Product Description: American Acoustics Labs is proud to introduce their Monster Midrange Monitor, the MT 70. As part of AAL's Pro Series the MT 70 offers the higher durability, reliability and technical performance required for commercial play. The MT 70 adds presence to any pro sound system with a 70° radial horn surrounded by four piezo electric tweeters.
Recommended Usages: The MT 70 is a durable cabinet designed specifically for midrange and high end use. American Acoustics Labs recommends using the MT 70 as part of our modular pro system.
Specifications: Midrange: 8 x 18 inch 70° radial horn with 60 watt compression driver.
Tweeter: Four 3-inch solid-state piezo electric.
Frequency Range: 1,200 - 25,000 Hz.
Impedance: 8 ohm nominal.
Crossover Point: 7,000 Hz.
Dispersion: 70°.
Connections: Push terminals and 1/4 inch phone jack.
Maximum Power Handling: 60 watts RMS program.
Speaker Protection: Fused.
Dimensions: 11¼ x 30 x 11¾ inches.
Suggested List Price: $450.00

AMERICAN ACOUSTICS LABS
PRO SERIES SC 410
629 W. Cermak Rd., Chicago, Illinois 60616
(312) 243-1310
Contact: James E. Straus, Asst. Mgr., Prod. Development.
Date Product Introduced: January 1979.
Product Description: The American Acoustics Labs Pro Series Model SC 410 is a portable sound column. The SC 410 utilizes a 3/4 inch enclosure covered with a black textured vinyl. The front latched cover and side mounted handles make the SC 410 truly portable. The SC 410 features four 10-inch accordion surround woofers with 3 piezo electric super tweeters. The SC 410 has a miximum handling capacity of 150 watts at 8 ohms.
Recommended Usages: The SC 410 is a conveniently portable vocal column. Ideal for use by professional musicians, entertainers or for permanent installation in auditoriums or concert halls.
Specifications: Four 10-inch accordion surround woofers.
Three 3-inch solid-state piezo electric tweeters.
60 - 25,000 hz frequency range.
8 ohm nominal impedance.
5,000 Hz crossover point.
Push terminals and 1/4 inch phone jack connections.
3/4 inch 45 lb. IPB with textured vinyl covering for cabinet material.
Minimum power required is 20 watts RMS program.
Maximum power handling is 150 watts RMS program.
Dimensions are 48 x 13 x 11 inches.
Suggested List Price: $300.00

AMERICAN ACOUSTICS LABS
PRO SEIRES W212
629 W. Cermak Rd., Chicago, Illinois 60616
(312) 243-1310
Contact: James E. Straus, Asst. Mgr., Prod. Development.
Date Product Introduced: January 1979.
PRODUCT DESCRIPTION: American Acoustics Labs now has available in its Pro Sound Series, the Model W212. Enclosed in a heavy duty 3/4 inch cabinet the W212 is extremely durable. This double folded horn enclosure features twin 12 inch woofers with 41 ounce magnets.
Recommended Usages: The Pro Series Model W212 is a sturdy cabinet designed specifically for low end use. American Acoustics Labs recommends using the W212 as part of our pro modular systems.
Specifications: Dual 12 inch accordion surround woofers with 41 ounce magnets and 1½ inch voice coils.
Frequency Range 40 - 5,000 Hz.
Impedance 4 ohm nominal.
Dual 1/4 inch phone jack connections.
Cabinet 3/4 inch plywood with textured vinyl covering.
Maximum power handling 200 watts RMS program.
Dimensions 28 x 48 x 20 inches.
Suggested List Price: $600.00

AUDICON, INC.
AUDICON ALPHA ONE MONITOR
1200 Beechwood Ave., Nashville, TN 37212
(615) 256-6900
Contact: Graeme Goodall, Sales Manager.
Date Product Introduced: June 1978.
Product Description: The Audiocon Alpha One is a highly evolved control room monitor system. Architectural consideration for maximum ease of integration into modern control room design is a primary design parameter.
Recommended Usages: Control room applications where sustained periods of high level monitoring is anticipated. Also very useful for disc mastering suites as a primary reference monitor.
Specifications: Three way speaker system wired for biamped operation. System includes dual 15" base drivers, a 2" midrange driver and horn/lens; and a high frequency slot driver, with high and low level crossovers.
Suggested List Price: Matched pair list price: $3,950.00

AUDIOANALYST INC.
PHASEMATRIX M2 WITH BASSMATRIX B1 — LOW FREQUENCY EXTENDER
27 South Main St., P.O. Box 33, Terryville, CT 06786
(203) 583-2535
Contact: David Howe, Chief Eng.; Janice Casey, Sales.
Date Product Introduced: January 1979.
Product Description: The M2 is a two way speaker system incorporating a 5" Polymer cone woofer and a 1" soft dome tweeter incorporating a unique variable acoustic filter (Phase-Matrix Grid). The B1 is a low frequency extender with built-in cross-over and automatic mixing of right and left channels in direct coupled (transformerless) configuration.
Recommended Usages: The M2 is a miniature loudspeaker system suitable for highly critical monitoring in remote and size limited situations. The B1 extension provides the lowest bass octaves for maximum impact and realism.
Specifications: The M2 with B1 price is $547.00 for a complete system. The system frequency response is 22 Hz - 20 KHz ± 3 dB in an average room.
Crossovers are 120 Hz and 2 KHz.
System power requirements: 10 watts minimum, 200 watts maximum.
M2 size: 9⅝" x 6" x 7".
B1 size: 27½" x 15½" x 11¾" (H x W x D).

AUDIOTOOLS, CORP.
ATM-1
5250 N. Broadway, Denver, CO 80216
(303) 534-5683
Contact: David Hadler, Vice President.
Date Product Introduced: May 1979.
Product Description: A 3-way studio monitor using Thiele-Small parameters for ported enclosures featuring direct radiators for

bass and mid, and slot radiator above 7 KHz time aligned placement. Mid linear column designed to avoid crossovers in 200 to 5 KHz critical vocal range. First full dynamic range studio monitor to achieve performance levels acceptable to both audiophiles and recording producers.
Recommended Usages: Critical control room environments where high volume levels are required and characteristic sound of compression drivers are not acceptable.
Specifications: Available in utility finish or walnut veneer. Write for specifications.
Suggested List Price: $1500.00

EASTERN ACOUSTIC WORKS, INC.
ATC SM 75-150 SOFT DOME
59 Fountain St., Box 111, So. Framingham, Mass 01701
(617) 620-1478
Contact: Ken Berger, National Sales Manager
Date Product Introduced: November 1978.
Product Description: The ATC SM 751150 is designed to operate over the 300 Hz to 3500 Hz band in high definition studio monitoring systems. The soft dome features the high acoustic output associated with horn loaded mid-drivers with the low distortion and accurate response available from the finest direct radiating devices. The soft dome was designed to offer excellent mechanical stability enabling high power handling with extremely low distortion (i.e.: 2nd harmonic better than −46 dB and third harmonic better than −60 dB).
Recommended Usages: The ATC soft dome is suited for applications requiring high definition reproduction of the mid band, like studio monitors when used with appropriate LF driver and HF driver.
Specifications: Max Power 150 W continuous sine wave.
Voice coil type 75mm edgewound ribbon wire.
Flux density 16500 gauss.
Frequency response 300 Hz to 1500 Hz: +2 dB.
Sensitivity: 92 dB 1w at 1m.
Suggested List Price: $328.50

EASTERN ACOUSTIC WORKS, INC.
THE MS-300 STUDIO REFERENCE MONITOR
59 Fountain St., Box 111, So. Framingham, Mass 01701
(617) 620-1478
Contact: Ken Berger, National Sales Manager.
Date Product Introduced: November 1978.
Product Description: The MS-300 is designed to offer the most accurate sound reproduction available for studio reference monitoring applications. The MS-300 achieves this goal by offering extended response, extremely low distortion, smooth amplitude response, with the high acoustic output required for modern monitoring applications. The use of the newly developed ATC 75mm soft-dome mid-driver greatly reduces the distortion and coloration normally associated with horn loaded monitors capable of similar acoustic output.
Recommended Usages: The MS-300 is ideally suited for any monitoring application requiring high acoustic output, smooth articulate response and durability to sustain high power levels.
Specifications: Frequency response: 30 - 18,000 Hz.
Sensitivity: 93 dB 1w at 1m.
Power Handling: 150 watts continuous sine-wave.
Suggested List Price: $950.00

ELECTRO-VOICE, INC.
B115-M AND B215-M BASS GUITAR SPEAKER SYSTEMS
600 Cecil St., Buchanan, MI 49107
(616) 695-6831
Contact: Chuck Gring, Music Products Sales Manager.
Date Product Introduced: January 1979
Product Description: 2-way bass guitar speaker systems featuring the vented cone midrange (VMR) driver for greater dispersion at the high end plus a front-mounted midrange level control. The B115-m contains one EVM15L low-frequency speaker while the B215-M contains two. Both are constructed of durable, black vinyl-covered 3/4" plywood with protective aluminum trim, metal mesh grille and recessed handles. The B215-M is also equipped with heavy-duty casters.
Recommended Usages: The B115-M produces a "light" sound which is often preferred by studios and jazz bass guitar players. The B215-M has a "heavy" sound for the rock bass players. Portable design and rugged construction make them ideal for on-the-road usage.
Specifications: Frequency Response: B115-M — 40 - 5,000 Hz; B215-M — 40 - 5,000 Hz.
Long-term Power Handling Capacity: B115-M — 200 watts; B215-M — 400 watts.
Impedance: B115-M — 8 ohms; B215-M — 4 ohms.
Suggested List Price: B115-M — $650.00; B215-M — $930.00

ELECTRO-VOICE, INC.
S18-3 STAGE KEYBOARD SYSTEM
600 Cecil St., Buchanan, MI 49107
(616) 695-6831
Contact: Chuck Gring, Music Products Sales Manager.
Date Product Introduced: August 1978.
Product Description: Three-way wide-range speaker system. Includes casters and side handles for easy transportation. Black vinyl-covered 3/4" plywood construction with aluminum

Monitor Speakers

trim on all edges. A metal mesh grille screen protects drivers from accidental damage. Uses EVM18-L woofer, ST350A tweeter and Electro-Voice's exclusive VMR vented midrange cone driver. Can be bi-amped.
Recommended Usages: Recommended for all applications that demand wide range frequency response such as that required by synthesizers and keyboards. The VMR midrange driver has the efficiency of a horn without the inherent inaccuracies, i.e. "honkeyness" of a horn. The ST350A offers incredibly wide dispersion, a full 120°, thus eliminating the need for precise positioning on an otherwise crowded stage or in the studio.
Specifications: Frequency Response: 40 - 16,000 Hz.
Long-term Power Handling Capacity: 200 watts.
Impedance: 8 ohms.
Suggested List Price: $693.75

THE ENERGY GROUP
ENERGY SM 115-2
13300 S.E. 30th, Bellevue, WA 98005
(206) 746-7200
Contact: Jullana Roberts, Communications Director
Date Product Introduced: October 1978.
Product Description: Studio Playback Monitor. Designed for use in recording studios as playback monitors. 2 way studio monitor HF Horn lens and 15" bass driver. Enclosed in rugged 9 ply birch cabinet. All joints are dado cut and joined with industrial grade adhesives. Finished with 2 part sprayed on vinyl.
Recommended Usages: Studio Playback Monitors.
Specifications: 1 15" Gauss 5831F Bass speaker.
1 McCauley 455 Diffraction lens.
1 JBL 2420 Driver.
Energy Group x-over plus biamp features.
Frequency Response: 38 Hz - 18,000 Hz +2dB.
Impedance: 8 ohms.
Sensitivity: 94 dB SPL.
Dimensions: 30 x 24 x 20 inches.
Suggested List Price: $800.00 each.

GOLLEHON INDUSTRIES, INC.
280 SRL
2431 Clyde Park SW, Grand Rapids, Michigan 49509
(616) 247-8231
Contact: John T. Gollehon, President.
Date Product Introduced: January 1979.
Product Description: The Gollehon 280 SRL offers the best value in professional sound reinforcement. An outstanding performance to size ration provides the quality, efficiency and full spectrum response you demand in a medium-size loudspeaker.
Recommended Usages: The 280 SRL is recommended for small to medium club or disco installations and widely accepted by performing groups from rock to gospel for professional sound reinforcement.
Specifications: Gollehon 2115 low-resonance woofer, Gollehon 4630 high-frequency driver and a new 8191 radial horn. The new 8191 horn distributes the top end over a 90° horizontal wedge, uniform with frequency. The 280 SRL with a 2 KHz crossover, is not suited for biamplification.

GOLLEHON INDUSTRIES, INC.
400 SL — STUDIO LOUDSPEAKER
2431 Clyde Park SW, Grand Rapids, Michigan 49509
(616) 247-8231
Contact: John T. Gollehon, President.
Date Product Introduced: January 1979.
Product Description: The Gollehon 400 SL is a new studio version of our highly acclaimed 400 SRL sound reinforcement loudspeaker. In every respect, the SL's performance, specifications, and reliability are identical less the frills of portability such as recessed handles and corner protectors.
Recommended Usages: The SL is recommended for permanent installations including disco and the theatre, where portable features are not required.
Specifications: Power Rating RMS 150 watts.
Frequency Response, 40 - 20 KHz 106 dB SPL 8 ohms.
Dispersion H/V 110°/50°.
Crossover Frequency 800 Hz 2 KHz.
A Gollehon 2115 15-inch woofer.
Gollehon 4690 horn.
Gollehon 4660 driver.
8110 radial horn.

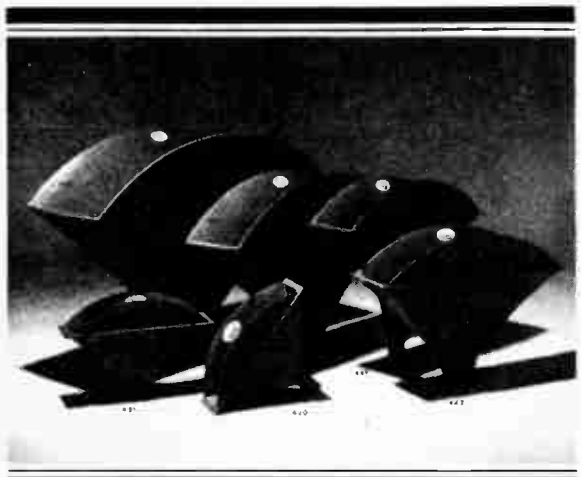
JAMES B. LANSING SOUND, INC.
4313 CONTROL MONITOR
8500 Balboa Blvd., Northridge, CA 91329
(213) 893-8411
Contact: Peter Horsman, Manager, Professional Division.
Date Product Introduced: February 1979.
Product Description: The 4313 features a new 10 inch low frequency driver, specially developed for accuracy and distortion free performance, and in-line mounting of the transducers for excellent stereo imaging. The low frequency component employs a 3-inch edge-wound copper time-aligned voice coil and a heavy 1.5 pound cast magnetic assembly. The 5-inch midrange loudspeaker is housed in an isolated subchamber to prevent interaction with the low frequency driver. Constructed of phenolic-impregnated linen, the 1-inch dome acts as a radiating area, resulting in exceptionally good dispersion. The dividing network achieves smooth frequency response and optimum blending of the component drivers by utilizing special phase-correcting circuitry and conjugate circuits for impedance leveling.
Recommended Usages: The 4313 is ideal for control rooms, small studios, mixdown facilities, or any other application in which the acoustic requirements call for a full-sized JBL monitor, but where space dictates a compact system.
Specifications: Maximum Power Input: 40 W continuous sine wave power.
Nominal Impedance: 8 ohms.
Frequency Response: 40 Hz - 18 KHz ± 3 dB.
Polar Response: No less than −6 dB at 130°; horizontal and vertical to 15 KHz.
Sensitivity: 89 dB SPL, 1W, 3.3 ft.; 40 dB SPL, 1mW, 30 ft.
Distortion— ½ power, 92 dB SPL 10 ft. single frequency: Less than 0.3% third harmonic generation from 100 Hz to 15 KHz.
Crossover Frequencies: 1 KHz, 4 KHz.
Finish: Oiled Walnut.
Grille: Dark blue fabric.
Enclosure Volume: 1.2 ft.
Dimensions: 22 ¾" x 14 ¼" x 9 ⁹⁄₁₆".
Net Weight: 42.5 lbs.
Shipping Weight: 49.5 lbs.
Suggested List Price: $369.00

McCauley Sound
Acoustic Lensed Horns

McCAULEY SOUND, INC.
485, 456, 455, 417, 416, 415 ACOUSTIC LENSED HORNS
13608 94th Ave. E., Puyallup, WA 98371
(206) 848-0363
Contact: Tom McCauley, Sales Manager.
Date Product Introduced: January 1979.
Product Description: The McCauley commercial series acoustic lensed horns are either of the slant-plate or the folded-plate type. Each lens assemble is manufactured from aluminum plate and is mounted to its respective aluminum cast exponential horn. Their crossover frequencies range from 500 Hz to 1200 Hz and each exhibits a wide smooth frequency response with-in its rate bandwidth.
Recommended Usages: They may be used where the throw does not exceed 60 feet and where a greater degree of horizontal dispersion of 130° is required. Because of the rigidness manufactured into these units their uses do not stop in just permanent installations yet are capable of much handling and missuse during concert tours.

McCAULEY SOUND, INC.
492, 462, 442, 441, 421, 420 RADIAL HORNS
13608 94th Ave. E., Puyallup, WA 98371
(206) 848-0363
Contact: Tom McCauley, Sales Manager.
Date Product Introduced: January 1979.
Product Description: The McCauley commercial series radial horns are all of aluminum cast construction. They all exhibit

dispersion patterns of 90° x 40° and range in cut-off frequencies from 375 Hz to 1200 Hz. Each model is formed directly to the flanged entry for specific bolt patterns. The exteriors of all McCauley radial horns have been dampened to bring the resonant frequency far below the rated crossover point.
Recommended Usages: The Model 492, being an extremely large radial, has the capacity to project frequencies below 400 Hz, while increasing the relative sensitivity by 2 dB throughout the rated bandwidth. This unit is well suited for lower crossover points in large sound systems. List price is $410.00
The Model 462 is recommended to be crossed at 500 Hz or higher. Again its primary function is for mid-range frequencies in large sound systems. List price $260.00
The Models 442 and 441 800Hz radials feature flanges for horn to enclosure mounting and a choice of one-inch or two-inch entries.
The Models 421 and 420 are well suited for compact two-way systems crossed at 1200 Hz. Both are equipped with mounting flanges and require a minimum of baffle area for mounting. The Model 421 is also used as the upper high frequency section in large multi-way systems. List price $80.00



McCauley Sound
Radial Horns

PROFESSIONAL AUDIO SYSTEMS ENGINEERING, INC.
PROFESSIONAL MONITOR STANDARD®
7330 Laurel Canyon Blvd., North Hollywood, CA 91605
Contact: Lon E. LeMaster, V.P. Marketing
Date Product Introduced: First unit, July 1976; new horizontal version July 1978.
Product Description: Professional Monitor Standard® loudspeaker systems were designed to fill the critical requirements of professional audio systems for very high SPL, with uncompromised performance and highest reliability. Latest developments in loudspeaker systems technology have been incorporated for improvement of overall quality, and substantial reduction of listener fatigue. Unique features include: 90° horizontal dispersion at all frequencies to 15 KHz; dramatically lower harmonic distortion; and the absence of harsh resonances, 'boomy' bass, and metallic, brittle highs.
Recommended Usages: Successful applications of the Professional Monitor Standard® loudspeaker systems to date include recording studio control room monitors, disc mastering reference monitors, control monitors for mobile recording vans, re-inforcement systems for live music, discoteque playback systems, and the production of electronic music from keyboards and synthesizers. The Professional Monitor Standard® systems are available in a vertical version, and a new horizontal version designed for control room applications with minimum vertical space above control room/studio windows.
Specifications: Available in 14 enclosure configurations, and selected hardwood veneers.
Suggested List Price: Starting from $819.00 each.

ROAD ELECTRONICS INC.
RS 7120 SPEAKER SYSTEM
2101 East 7th St., Los Angeles, CA 90021
(213) 473-6751
Contact: Ed Swanzey, Sales Manager.
Date Product Introduced: December 1978.
Product Description: Full range, two-way all horn-loaded speaker system featuring a Road special design 12" speaker and high frequency Piezo tweeter.
Recommended Usages: General sound reinforcement.

SHOWCO MANUFACTURING CORPORATION
MODEL 1100 FULL RANGE SPEAKER SYSTEM
1221 Round Table Drive, Dallas, TX 75247
(214) 630-7121
Date Product Introduced: November 1978.

Monitor Speakers

Product Description: The Showco Model 1100 is a full range speaker system with a heavy duty 15" woofer utilizing ferrofluid in the voice coil gap. This speaker is designed for applications requiring smaller physical size and lighter weight, yet it is able to reproduce full "disco" levels.
Specifications: Model 1100: Three way speaker system, 15" bass, 2-5" mid-range, 2 high frequency horns.
Suggested List Price: $390.00

SHOWCO MANUFACTURING CORPORATION
MODEL 1405 MID-HIGH SPEAKER SYSTEM
1220 Round Table Drive, Dallas, TX 75247
(214) 630-7121
Date Product Introduced: November 1978.
Product Description: The Showco Model 1405 three way speaker system is designed to reproduce a broad range of frequencies at high sound pressure levels. This unique design of folded mid/bass horn and mid/high frequency drivers is an ideal companion for the Showco Model 1700 low frequency speaker in a bi-amplified sound system. The physical dimensions and shape of the enclosure lends itself to installations with ceiling heights as low as 8'. The cabinet is finished in a natural walnut grained laminate and further enhanced by an acoustically transparent black fabric grille.
Specifications: Model 1405: 12" mid bass, 4-5" mid-range, 4 high frequency horns, 200Hz up, 100 watts, 14" x 14½" x 42".
Suggested List Price: $435.00

SHOWCO MANUFACTURING CORPORATION
MODEL 1700 LOW FREQUENCY SPEAKER SYSTEM
1221 Round Table Drive, Dallas, TX 75247
(214) 630-7121
Date Product Introduced: November 1978.
Product Description: The Showco Model 1700 low frequency speaker system is designed to reproduce the tremendous bass levels now required in sophisticated sound systems. This demand for enhanced low frequency performance has increased the occurrence of woofer failure in many "disco speakers". Showco recognized the damaging effect and inconvenience on a club's business as a result of speaker failures. Several years ago, we explored the use of a unique and expensive material called Ferrofluid. This remarkable fluid greatly increases the power handling and heat dissipation in our speaker systems resulting in substantially reducing woofer failure. Combining this technological achievement with woofers utilizing large magnet structures, edge-wound voice coils, and cast frames with a unique new low frequency horn design results in exceptional low bass and extremely smooth response to 800Hz. These are qualities not found in low frequency horn designs of the past.
Specifications: Model 1700: Dual 15" high efficiency bass speaker, 300 watts, 35Hz to 500Hz, 34" x 30" x 60".
Suggested List Price: $750.00

SHOWCO MANUFACTURING CORPORATION
MODEL 1800/1500 PYRAMID SPEAKER
1221 Round Table Drive, Dallas, TX 75247
(214) 630-7121
Date Product Introduced: November 1978.
Product Description: The Showco Pyramid speakers are full range speaker systems designed to produce extremely clean, undistorted sound at all listening levels. The patented enclosure design integrates the best features of two time-proven techniques: a fully symmetrical folded horn for maximum efficiency and clarity in bass reproduction; and front mounted mid and high frequency drivers that provide both direct and reflected sound for optimum dispersion in the sound field while maintaining low listener fatigue even at extreme disco levels of over 120dB. The requirement for enhanced low frequency performance combined with the high sound pressure levels now demanded in today's discos and clubs has increased the occurrence of woofer failure in many "disco speakers". Showco recognized the damaging effect and inconvenience on a club's business as a result of speaker failures. Several years ago, we explored the use of a unique and expensive material called Ferrofluid. This remarkable fluid greatly increases the power handling and heat dissipation in our speaker systems resulting in substantially reducing woofer failure. Combining this technological achievement with woofers utilizing large magnet structures, edge-wound voice coils, and cast frames with a newly improved extremely rigid cabinet of 1" high strength, acoustical material results in high efficiency, low distortion, and will provide the club with years of trouble-free performance.
Specifications: Patent: Showco designed Pyramid Speaker systems awarded U.S. patent #3,912,866.
Pyramid Model 1500: 15" bass, 4-5" mid-range, 2 high frequency horns. 29½" x 29½" x 25".
Pyramid Model 1800: 18" bass, 4-5" mid-range, 4 high frequency horns. 29½" x 29½" x 25".
Pyramid 1800X — Bi-amplified speaker.
Pyramid 1800B — Bass only speaker.
Utility cabinet in flat black lacquer.
Suggested List Price: $780.00 (1800), $735.00 (1800ut), $735.00 (1800X), $690.00 (1800XUT), $630.00 (1500), $585.00 (1500UT), $540.00 (1800B), $495.00 (1800BUT).

T.H.E. CO.
"THE ONE"
28 Music Square East, Nashville, TN 37203
(615) 320-0807
Contact: John W. Gardner, President.
Date Product Introduced: June 1978.
Product Description: A 3-way high level monitoring system consisting of two (2) 15" woofers, a unique wood midrange horn and an ultra high frequency tweeter. The system is designed for bi or tri amplification.
Recommended Usages: Ideal for recording studio control room monitoring, disk mastering monitoring and any critical playback situation.
Specifications: Power Handling — Bi Amp — Lows 200W, Highs 200W.
Size: 44"W x 30"H x 20"D.
Suggested List Price: $1,695.00/ea.

The Ashly Package

Now Ashly offers a new dimension in audio control. It's a complete package of the most up-to-date signal processing equipment around. And its capabilities will amaze you.

Like building blocks it can be assembled one part at a time and used in any combination to suit your audio needs. It's as versatile as you are.

Rack mounted and designed for the most rigorous use, the 16-gauge steel units (feel the weight yourself) hold up on the road, on the stage, or in the studio.

From brilliant highs to rich lows, the units remove unwanted noises, sustain guitar, monitor audio gain, improve the efficiency of your speaker system, and can even help you find new sounds.

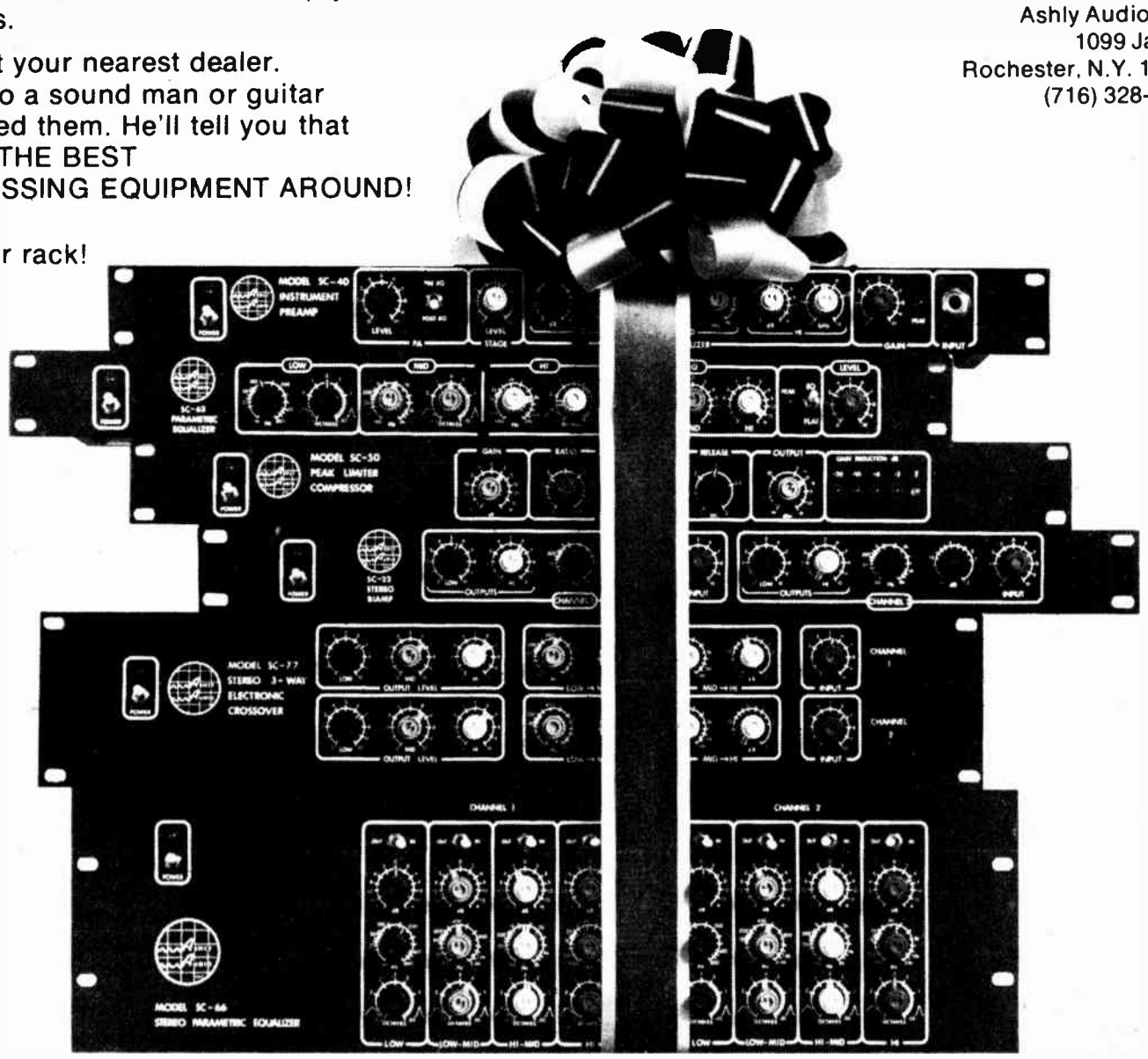
Test them out at your nearest dealer. Better yet, talk to a sound man or guitar player who's used them. He'll tell you that ASHLY MAKES THE BEST SIGNAL PROCESSING EQUIPMENT AROUND!

Put some in your rack!

SC-40 Instrument Preamp. $349
SC-50 Peak Limiter Compressor. $299
New SC-63 Mono Parametric Equalizer. $369
New SC-22 Stereo 2-Way Crossover. $290
SC-77 Stereo 3-Way Crossover. $429
SC-66 Stereo Parametric Equalizer. $599

NOTE: The full Ashly line also includes the SC-60 Professional Parametric Equalizer, SC-55 Stereo Peak Limiter Compressor, the SC-70 3-Way Electronic Crossover, and the SC-80 4-Way Electronic Crossover.

Ashly Audio, Inc.
1099 Jay St.
Rochester, N.Y. 14611
(716) 328-9560



THE ASHLY PACKAGE IS IN STOCK AT

Bananas At Large
802 4th St.
San Rafael, Ca. 94902
(415) 457-7600

Guitar Showcase
3090 So. Bascom Ave.
San Jose, Ca. 95124
(408) 377-5864

Valley Arts Guitar
12162 Ventura Blvd.
Studio City, Ca. 91604
(213) 763-3397

California Musical Instrument Co.
1019 E. Vermont Ave.
Anaheim, Ca. 92805
(714) 533-8610

Sound Stage
1615 N. Blackstone
Fresno, Ca. 93726
(209) 233-6531

Westwood Music
1611 Westwood Blvd.
Westwood, Ca. 96137
(213) 478-4251

Signal Processing Devices

ASHLY AUDIO INC.
ASHLY SC-22 STEREO TWO WAY ELECTRONIC CROSSOVER
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager.
Date Product Introduced: June 1979.
Product Description: The Ashly SC-22 is a stereo bi-amp crossover. It features an input level control and individual low and high output level controls. The crossover frequency is tunable over a 5.6 oct. range. Also provided is a rolloff control that flattens the response in the crossover region. The peak overload lite warns of overload anywhere in the crossover. All outputs of the SC-22 come out in phase.
Recommended Usages: The Ashly SC-22 is ideal for any application that calls for a stereo two way crossover.
Specifications: Input Impedance: 10K balanced.
Output Impedance: 50 ohm, terminate with 600 ohm or greater.
Max. level In/Out: + 20.
Hum and Noise: – 95 dBv, all outputs unity gain.
Distortion: less than .05% THD 1KHz, + 10 dBm.
Size: 1¾" high 19" wide (rack mount) 6" deep.
Suggested List Price: $290.00

ASHLY AUDIO INC.
ASHLY SC-40 MUSICAL INSTRUMENT PRE-AMP
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager.
Date Product Introduced: June 1979.
Product Description: The Ashly SC-40 is a high performance preamp designed especially for today's performing musician. One compact unit amplifies the signal with a low noise FET input stage, processes the signal with a three band tunable semi-parametric equalizer, and provides multiple outputs for easy interfacing with any system. Both hi and lo gain inputs are provided. A peak overload lite monitors all parts of the preamp. Two output level controls are provided. The stage level comes out at both high and low level and the PA output comes out both balanced mic level and unbalanced line level. The PA output is switchable pre/post eq. A line level effects loop is also provided.
Recommended Usages: The Ashly SC-40 is ideal for any guitar, bass or keyboard. It's wide range of EQ and choice of outputs make its use versatile on the stage as well as in the studio. A variety of compact, modular instrument set ups can be designed around the SC-40.
Specifications: Input Impedance: 2 meg ohm.
Output Impedance: Stage Output— Hi level 100 ohm terminate with 600 ohm or greater PA output; Mic level 600 ohm balanced.
Max. Level In/Out: + 20 dBm.
Distortion: Less than .05% THD 1KHz + 10 dBm.
Hum and Noise: – 90 dBv.
Size: 1¾" high 19" wide (rack mount) 6" deep.
Suggested List Price: $349.00

ASHLY AUDIO INC.
ASHLY SC-50 PEAK LIMITER/COMPRESSOR
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager
Date Product Introduced: June 1979.
Product Description: The Ashly SC-50 is a high quality peak limiter/compressor that provides clean and accurate control of peak levels in any type program material. Front panel controls include bypass switching, gain ratio, attack time, release time, and output level. Features include a unique program controlled release time circuit that reduces the audible side effects of limiting and a LED display to monitor gain reduction. A stereo tie is provided and tracking between units is excellent. The Ashly SC-50 provides the safety and convenience of a peak limiter without the usual trade off of increased noise and distortion.
Recommended Usages: The Ashly SC-50 can be used to eliminate clipping distortion in peak sensitive equipment such as tape recorders loudspeakers, power amplifiers, disc cutters, and broadcast transmitters. Program material can be made louder without any increase in peak level. Musical instrument sustain can be accomplished. The SC-50 can be used to control vocal level or in tape to disc transfer or anywhere firm positive control of peak levels is needed.
Specifications: Input Impedance: 10K balanced.
Output Impedance: 50 ohm, terminate with 600 ohm or better.
Max Level in/out: + 20 dBm
Hum and Noise: – 90 dBm, unity gain.
Distortion: less than .05% THD, 0 dBm 20 Hz - 20 KHz; less than .2% + 20 dBm worst case.
Size: 1¾" high 19" wide (rack mount) 6" deep.
Suggested List Price: $299.00

ASHLY AUDIO, INC.
ASHLY SC-55 STEREO PEAK LIMITER/COMPRESSOR
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager.
Date Product Introduced: June 1979.
Product Description: The Ashly SC-55 is the stereo version of the SC-50 Peak Limiter/compressor. Front panel controls adjust gain, balance, ratio, attack time, release time, and left and right output level. A bypass switch is also provided as is a tie for multiple channel operation. Gain reduction is monitored with a unique LED display. The audible effects of limiting are reduced with program controlled double release circuit. Like it's mono counterpart the SC-55 is ultra clean and quiet.
Recommended Usages: The Ashly SC-55 provides control of all limiting characteristics so that it's action can be adjusted to suit any application. The uncertain peak levels which often occur in live situations and recording sessions can be held within a usable range without destroying dynamics. Typical applications include loudspeaker protection, tape recorder limiter, vocal level control, broadcast limiter, tape to disc transfer, and musical instrument sustain.
Specifications: Input Impedance: 10K balanced.
Output Impedance: 50 ohm, terminate with 600 ohm or greater.
Max. level In/Out: + 20 dBm.
Hum and Noise: – 90 dBm, unity gain.
Distortion: less than .05% THD, 0 dBm 20 Hz - 20 KHz; Less than .2% THD, + 20 dBm worst case.
Size: 3½" high 19" wide (rack mount) 6" deep.
Suggested List Price: $499.00

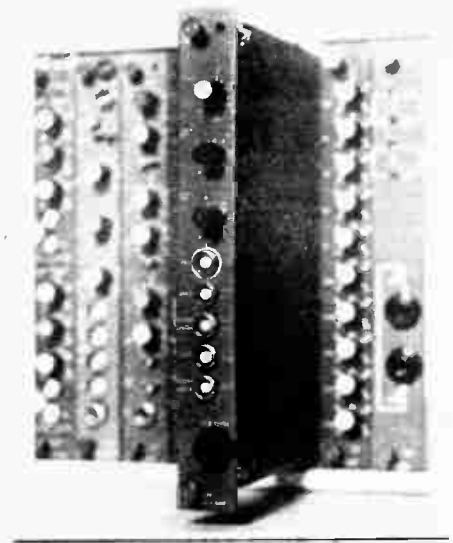
ASHLY AUDIO INC.
ASHLY SC-70 THREE WAY ELECTRONIC CROSSOVER
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager.
Date Product Introduced: June 1979.
Product Description: The Ashly SC-70 is a three way electronic crossover that features a wide range of adjustment. Crossover points are continuously variable and tune over a 5.6 oct. range. Rolloff is also continously variable and can be used to flatten response in the crossover region. Level controls are provided for the input and low, mid, and high outputs. A peak lite warns you of impending overload. The SC-70 is one of four different electronic crossovers in the Ashly line.
Recommended Usages: The SC-70 can be used in any application where a three way crossover is desired. Because it is tunable it can also be used in a two way configuration.
Specifications: Input Impedance: 10K balanced.
Output Impedance: 50 ohm, terminate with 600 ohm or better.
Max. level In/Out: + 20 dBm.
Hum and Noise: – 95 dBv all outputs unity gain.
Distortion: less than .05% THD 1 KHz + 10 dBm.
Size: 1¾" high 19" wide (rack mount) 6" deep.
Suggested List Price: $250.00

ASHLY AUDIO INC.
ASHLY SC-77 STEREO THREE WAY ELECTRONIC CROSSOVER
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager.
Date Product Introduced: June 1979.
Product Description: The Ashly SC-77 is a stereo three way crossover that features a wide range of adjustment. Crossover points are continuously variable over a 5.6 oct. range. Level controls are provided for the input and each one of the outputs. All outputs come out in phase. A peak overload lite monitors all sections of the crossover. It's specially designed output section enables it to drive long runs of cable with no signal loss. The SC-77 is one of four different crossovers in the Ashly line.
Recommended Usages: The Ashly SC-77 can be used anywhere a stereo three way crossover is desired. Because it is tunable it can also be used in a stereo two way configuration or in a mono five way configuration.
Specifications: Input Impedance: 10K balanced.
Output Impedance: 50 ohm, terminate with 600 ohm or greater.
Max. Level In/Out: + 20 dBm.
Hum and Noise: – 95 dBv all outputs unity gain.
Distortion: Less than .05% THD 1 KHz + 10 dBm.
Size: 1¾" high 19" wide (rack mount) 6" deep.
Suggested List Price: $429.00

ASHLY AUDIO INC.
ASHLY SC-80 FOUR WAY ELECTRONIC CROSSOVER
1099 Jay St., Rochester, NY 14611
(716) 328-9560
Contact: Shelley Malloy, Customer Service Manager.
Date Product Introduced: June 1979.
Product Description: The Ashly SC-80 is a mono four way electronic crossover that features a wide range of adjustment. Crossover frequencies are tunable over a 5.6 oct. range. Level controls are provided for the input as well as each one of the outputs. All outputs come out in phase. A peak overload lite monitors all sections of the crossover. A specially designed output section drives long cable runs with no loss of signal. A unique rolloff control is used to flatten response in the crossover region. The SC-80 is one of four different electronic crossovers in the Ashly line.
Recommended Usages: The SC-80 can be used anywhere a four way crossover is needed. Because of it's tuning capability it can also be used in a mono three way configuration.
Specifications: Input Impedance: 10K balanced.
Output Impedance: 50 ohm, terminate with 600 ohm or greater.
Max. level In/Out + 20 dBm.
Hum and Noise: – 95 dBv all outputs Unity gain.
Distortion: Less than .05% THD 1KHz + 10 dBm.
Size: 3½" high 19" wide (rack mount) 6" deep.
Suggested List Price: $349.00

AUDICON, INC.
"THE PLATE"
1200 Beechwood Avenue, Nashville, TN 37212
(615) 256-6900
Contact: Graeme Goodall, Sales Manager.
Date Product Introduced: May 1979.
Product Description: Electromechanical reverb system with stereo output, and low noise electronics.
Recommended Usages: A high quality reverb device suitable for recording studios, broadcast, and film sound applications.
Suggested List Price: $4,500.00

Signal Processing Devices



Audio & Design Recording
Scamp SO2 Transformerless Mic Pre-amp

AUDIO & DESIGN RECORDING LTD. (ADR)
SCAMP SO2 TRANSFORMERLESS
MICROPHONE PRE-AMPLIFIER
P.O. Box 902, Marina, CA 93933
(408) 372-9036
Contact: Nigel Branwell.
Date Product Introduced: Due for release May 1979.
Product Description: The Scamp SO2 Microphone Pre-Amp will interface between low level signals at source and the whole range of Scamp Signal Processors. The unit is transformerless and features a 30 dB pad and phase reverse switch, channel mute switch, high pass filter, auxiliary send — pre or post (switchable), 600 ohm line amp drive on both outputs, 70 dB gain with LED Optimum Modulation indicator, and Hi Z Input on a front panel jack socket for direct injection plus 48 volt Phantom Powering to microphones.
Recommended Usages: Suitably equipped with the SO2 Mic Pre-amp the Scamp System is now accessible to musicians, radio & TV production suites, theatres and other PA systems; apart from its already wide use in recording studios. This significant addition means that the Scamp range can be used from any signal source right through to the final medium. Be it tape, optical film, on air broadcast, disc, or stage.
Specifications: Input: 600 ohms.
Output: less than 1 ohm.
Max. output level: + 24 dBm.
Max. Gain: 70 dB.
Input Pad: 30 dB.
Frequency Response: 20 Hz - 20 KHz ± 0.5 dB.
Distortion: Less than 0.05% THD.
Noise: – 125 dBm Fef. 70 dB gain, 300 ohm source, 20 Hz 20 KHz bandwidth.
Common Model Rejection: Better than – 90 dB.
High Pass Filter: 12 dB/octave – 3 dB 160 Hz.
Suggested List Price: $390.00

AUDIO & DESIGN RECORDING LTD.
SCAMP S100 DUAL GATE
84 Oxford Rd., Reading, Berks, England
Audio & Design Recording (USA)
P.O. Box 902, Marina, CA 93933
(408) 372-9036
Contact: Nigel Branwell.
Date Product Introduced: Due for release May 1979.
Product Description: 2 Noise Gates in a one inch Scamp module — simplicity itself to operate with LED's to show operating state and the finest specifications available. The electronics are totally maintenance free; the unit comes to you factory-set for action. Optimised Attack (or open) time of around 10 usec. (the theoretical limit in the audio band) assures no audible transient loss. Release (or close) time, attenuation and threshold are all variable. The Unit is keyable from any external, line level signal Source.
Recommended Usages: Operationally the S100 Dual Gate, with a Threshold continuously variable between – 50 dB and infinity, can provide low level source noise reduction and automatic attenuation of non-contributing channels. It will 'tighten-up' flabby drums, eliminate cross-mic pickup on overdubs and 'crispen' vocals etc. Broadcasters can cut down on infuriating 'line' noise on phone-ins and film makers can restrict ambience. The S100 Dual Gate will find useful applications anywhere sound is recorded, whatever the medium or purpose.
Specifications: Input: Electronically balanced — greater than 12K ohms — unity gain.
Output: Unbalanced — less than 1 ohm, max + 24 dBm.
Noise: Better than – 90 dBm.
Frequency Response: + 0, – 0.5 dB, 20 Hz - 25 KHz.
Distortion: Better than 0.1% at 0 dBm at 1 KHz.
Attack: Optimised to around 10uS.
Release: Continually variable 0 - 40 dB attenuation.
Threshold: – 50 dBm to Infinity.
Key Input: Line Level.
Format: Scamp.
Power: Scamp.
Suggested List Price: $390.00

B & B AUDIO (MARKETED BY APHEX SYSTEMS, LTD.)
B & B AUDIO CX-1 COMPRESSOR/EXPANDER
7801 Melrose Ave., Los Angeles, CA 90046
(213) 655-1411
Contact: Kent S. Beyer, Director of Sales.
Date Product Introduced: May 1979.
Product Description: The CX-1 is a 5¼" x 1½" modular compressor/expander featuring the B&B Audio VCA as a functional element. Controls: Compression Threshold, compression release time, expansion threshold, expansion release time, expansion depth, input level. Switches: Compression metering, expansion metering compression in/out, expansion in/out, master in/out, output metering. Displays: 10 segment bar-graph to show expansion/compression level, input overload LED, output overload LED. Separate EQ patch points for access to compressor/expander detector.
Recommended Usages: Film dialog processing, control of leakage on music tracks, noise gating, dynamic modification of music, general compression/expansion applications.
Specifications: Maximum input and output: + 26 dBv.
Gain Range: ± 20 dB (40 dB).
THD (worst case): 0.2%.
IMD (worst case): 0.2%.
Maximum gating: 40 dB.
Maximum compression: 30 dB.
Output noise: – 90 dB (at unity gain).
Compression release time: 50 mSec to 2.5 Sec.
Expansion release time: 50 mSec to 2.5 Sec.
Attack time: 1 uSec.
Frequency Response: ± 1 dB 20 hz to 60 KHz.
Slew rate: 10V/uSec.
Overshoot and ringing: none.
Suggested List Price: $400.00

BODE SOUND CO.
BODE FEEDBACK STABILIZER, MODEL NO. 741XR
1344 Abington Place, No. Tonawanda, N.Y. 14120
(716) 692-1670
Contact: Harald Bode (Partner), President.
Date Product Introduced: Series C of Model 741XR was introduced late 1978.
Product Description: The 741XR Feedback Stabilizer is a frequency shifter for the control of acoustical feedback in sound reinforcement systems. The feedback effect leading to the howl, is caused by resonances in the listening area and by their build-up through many round trips of the sound from the speaker to the microphone. By inserting the Feedback Stabilizer in the system, the program frequencies are shifted away from the resonance peaks to eliminate the cause of the howl.
Recommended Usages: For howl control in auditoriums, concert halls and the like with a reverberation time of at least one second. Usages not limited to speech, but also applicable for music, where surprisingly no "detuning" effect is noticed. (More on the subject on request.)
Specifications: Frequency Response ± 1 dB from 30 Hz to 20,000 Hz (with A.M. less than 0.1 dB to 16,000 Hz).
Distortion below 1% at 1000 Hz.
Max output level + 18 dBm into 600 ohm load.
Input impedance greater than 25K ohms.
Source impedance any value.
Output noise 62 dB (unweighted) below rated output, 82 dB (A-weighted).
Gain – 8 to + 10 dB (adjustable).
Frequency shift 1.4 to 7.0 Hz adjustable in 11 steps.
Front panel controls: power switch, fuse status switch (IN/OUT), LED indicators.
Rear panel controls: Gain, amount of shift and Up/Down shift switch.
3½ x 19" rack mount.
Suggested List Price: $645.00

BODE SOUND CO.
BODE VOCODER, MODEL NO. 7702
1344 Abington Place, No. Tonawanda, N.Y. 14120
(716) 692-1670
Contact: Harald Bode (Partner), President.
Date Product Introduced: July, 1978.
Product Description: Signal processor comprising Voice (Program) input and Carrier Input, with voice signal being analyzed in 16 bandpass channels with envelope followers, yielding 16 selective control voltages, and carrier signal being entered into 16 corresponding synthesizer channels with V.C.A's, controlled by analyzer control voltages, thus causing the overtone characteristics of the voice to be imposed on the carrier input signals. A voice controllable high frequency bypass extends the unpitched range and enhances intelligibility (Pat. Pend.).
Recommended Usages: Adding vocals to synthesized music. production of jingles. Having a synthesizer (playing into Carrier input) "copy" sounds entered into Voice Input, such as violin to create true string section. Creation of new effect by giving music source drum sound envelope. Special effects like making vacuum cleaners or other environmental sound sources speak or to make a famous newscaster sing the news, and many more entertaining effects for the recording studio and the road.
Specifications: Over all frequency response 50 - 15,000 Hz.
Vocoding section 50 - 5,080 Hz, high frequency section 5,080 Hz - 15,000 Hz.
16 analyzer channels with 6 ms response envelope followers and 16 synthesizer channels with precision V.C.A.'s.
Level tracking 60 dB.
Signal to Noise Ratio better than 70 dB.
Nom Voice Input levels 0 dBm (Line) at 20K ohm and – 40 dBm (Mic) at 30K ohms.
Nom Carrier input level 0 dBm at 100K ohm.
Output Max + 15 dBm at 600 ohms.
19"W x 7"H x 12"D (without controls).
Shipping weight 17 lbs.
Suggested List Price: $5,600.00

Bode Sound Company
Model 7702 Vocoder

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dbx, INC.
148 NOISE REDUCTION DECODER FOR BROADCAST
71 Chapel St., Newton, MA 02195
(617) 964-3210
Contact: Larry Jaffe, Director of Mktg & Sales, Pro Products.
Date Product Introduced: March 1979.
Product Description: Eight-channel playback dbx noise reduction unit with plug-in modular chassis with room for a spare module. Uses 2:1 compression and expansion, rack mount housing with "mainframe" concept. Automatically switches to "bypass" in the event of power failure.
Recommended Usages: For broadcast, improves sound of cartridge tape machines, extends life of "obsolete" reel-to-reel playback units, quiets audio track on VTR's. For use with dbx 142, two channels switchable record/play noise reduction unit.
Specifications: 30 hz to 20 KHz ± 1 dB.
Equivalent input noise – 88 dBm.
Max input level + 24 dBm.
Transformer inputs and outputs for each playback channel.
Interface via 27-pin connectors.
Suggested List Price: $3000 with eight decoders.

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dbx, INC.
165 "OVER-EASY" COMPRESSOR/LIMITER
71 Chapel St., Newton, MA 02195
(617) 964-3210
Contact: Larry Jaffe, Director of Mktg & Sales, Pro Products
Date Product Introduced: Will be May 1979.
Product Description: dbx's patented "Over-Easy"™ Compressor with adjustable compression ratio, threshold, and output level. Has automatic or variable attack and release times for special effects. Front panel meter indicates input/output/gain change. Single channel unit, strapple for true stereo operation.
Recommended Usages: Broadcast stations (well suited for FM or TV), recording studios, disc mastering, sound reinforcement. Can be tailored to the exact attack and release behavior required.
Specifications: Attack variable from 1 to 400 dB/ms.
Release variable from 10 to 4000 dB/s.
Compression variable from 1:1 to infinity.
Max input level + 24 dBm.

SUNTRONICS
Creative Audio Technology

PRESENTS

SPECTRO ACOUSTICS

If you are looking for an alternative to high-priced studio amplifiers, equalizers and preamps for monitoring, mixdown or signal processing, Suntronics has the "Spectro Acoustic" solution.

All Power amplifiers are constructed with easily replaceable output modules, covered by a three-year parts and labor warranty.

All units also available in standard rack-mount configurations.

(714) 985-0701 P. O. Box 734 1620 W. Foothill Blvd. UPLAND, CA 91786

Signal Processing Devices

Max output level +23 dBm.
Threshold variable from −40 to +10 dBm.
Suggested List Price: "Over-Easy" behavior exclusive with dbx. Comes with stereo coupler cable. $550.00

dbx, Inc.
Over Easy Comp/Limiter

DELTALAB RESEARCH, INC.
DL-3 DIGITAL DELAY LINE
27 Industrial Ave., Chelmsford, MA 01824
(617) 256-9034
Contact: Philip M. Markham, Sales and Marketing.
Date Product Introduced: May 1979.
Product Description: The DL-3 Digital Delay Line is a one input/one output digital delay line designed for applications where sonic accuracy is mandatory and only one delay is required. The LD-3 sets new standards in price/performance for digital delay.
Recommended Usages: The DL-3 Digital Delay Line is recommended for under balcony areas in small theaters, auditoriums, etc. Adding delayed side-channel speakers to a disco or nightclub "opens up" the sound making it more spacious and provides an exciting, dynamic impact and punch which must be heard to be appreciated. In live performances, the DL-3 can be used to increase stage presence. Uses in the studio include Haas-effect image localization, doubling and pre-reverb delay.
Specifications: 20-15 KHz bandwidth at all delay lengths.
THD + noise of less than 0.2%.
One input/one output.
Delays from 1 - 120ms.
Built in bypass.
Security cover for permanent installations.
Dynamic range greater than 90 dB.
Suggested List Price: $775.00

ELECTRO-HARMONIX, INC.
AMBITRON
27 West 23rd St., New York, NY 10010
(212) 741-1770
Contact: Larry DeMarco, Customer Relations Mgr.
Date Product Introduced: August 1978.
Product Description: The Ambitron uses matrixing filtering, and analog delay (with companding noise reduction) to simulate natural acoustic ambience. It accepts a stereo input and provides front channel stereo output with variable delay time, delayed signal level, and separation enhancement, and a rear channel stereo output with variable delay time and delayed signal level. Controls are Input and Output Level, Separation Enhancement, Ambience Delay, Ambience Level, and Power switch. Power and Overload indicators. RCA-type phone jacks.
Recommended Usages: Originally designed as a high-fidelity system accessory, the Ambitron has been found to be a valuable studio tool for creating ambient liveness with the frequency and phase characteristics of acoustic spaces.
Specifications: Input Impedance: 100K ohms.
Output Impedance: 0.3 vrms minimum, 2.0 vrms optimum.
Max. Output Level (Dynamic Range at Unity Gain): 28 v p-p (2 vrms input).
Direct Signals: Frequency Response: 0 Hz to 140 KHz, +0, −3 dB.
Total Harmonix Distortion: less than 0.08%, 20 Hz to 20 KHz.
Hum & Audible Noise: −65 dB; Total Noise: −50 dB.
3 lbs., 10 ¼"W x 6 ¾"D x 2 ¼"H.
Suggested List Price: $279.00

ELECTRO-HARMONIX, INC.
MEMORY MAN DELUXE ECHO/CHORUS/VIBRATO
27 West 23rd St., New York, NY 10010
(212) 741-1770
Contact: Larry DeMarco, Customer Relations Mgr.
Date Product Introduced: July 1978.
Product Description: The Memory Man Deluxe employs analog delay (with companding noise reduction) to create a wide range of echo/delay effects, including repeating arpeggios, "slap-back" echo, "cardboard tube" reverb, chorusing, vibrato, and pitch shifting. Controls are Input Level (provides attenuation and gain), Delay, Feedback, Effect/Direct Blend, Chorus/Vibrato depth, Chorus/Vibrato selector, Power and Bypass switches. Power and Overload indicators. Effect and Direct outputs.
Recommended Usages: Suitable for use with guitar pick-ups, high impedance microphones, electronic instruments, unbalanced echo sends and mixer outputs.
Specifications: Input Impedance: 100K ohms.
Output Impedance: 150 ohm min., 2.5K ohms max.
Delay: 35 millisecond min., 0.5 second max.
Frequency response: delay signal — 40 Hz to 3.5 KHz; Direct signal — 16 Hz to over 20 KHz.
3 lbs., 8" x 6 ¾" x 1 ½".
Suggested List Price: $299.00

ELECTRO-HARMONIX, INC.
VOCODER
27 West 23rd St., New York, NY 10010
(212) 741-1770
Contact: Larry DeMarco, Customer Relations Mgr.
Date Product Introduced: October 1978.
Product Description: The Vocoder employs 2 sets of 14 active bandpass filters to impress the harmonic characteristics of a speech (or other) signal on a music (or other) signal. Controls include Microphone and Music Sensitivity and Blend sliders, Mike or Music Bypass, and Standby. Housed in a standard 19" rack mountable chassis (5 ¾"H x 5 ⅛"D), it may also be used as a free-standing unit.
Recommended Usages: The primary use of the Vocoder is to obtain "musical speech" effects with microphone and synthesizer, organ, guitar, or other instrument, in either a studio or live performance situation.
Specifications: Music: Input Impedance: 47K ohms.
Max. Input Level: +16 dBm.
Preamp Gain: 35 dB.
Microphone: Input Impedance: 47K ohms.
Max. Input Level: 0 dBm.
Preamp Gain: 6 dB.
Output: 150 ohms; 0 dBm nominal, 14 dB headroom.
Filter Center Frequencies (Hz): 246, 298, 361, 438, 530, 642, 778, 943, 1142, 1384, 1677, 2031, 2461, 2982.
Weight: 9 lbs.
Suggested List Price: $799.00

EV—TAPCO
CP-X
3810 148th Ave N.E., Redmond, Wash 98052
(206) 883-3510
Contact: J. Michka, Staff Writer.
Date Product Introduced: May 1979.
Product Description: CP-X is a low level electronic crossover with features including: 3 pole maximally flat Butterworth filters, balanced (AGLC)/unbalanced operation level controls for all outputs, single knob frequency control phase reversal switching, relay and protected outputs.
Recommended Usages: The CP-X is designed for any biamp or triamp power system for any type of PA or recording monitor set-up that allows maximum crossover control up front. Power driver outputs allow "at-the-board" usage, or in an on-stage amp rack.
Specifications: Frequency Response: 20 - 20KHz ± .5dB.
Signal to Noise: 110dB (max output).
THD: ◄.05%.
SMPTE IM Distortion: ◄.05%.
CCIF IM Distortion: ◄.05%.
Slew Rate: better than 11v per microsecond.
Rise Time: 2.4 microseconds (100KHz, 10v pp).

GENTLE ELECTRIC
MODEL 101 PITCH AND ENVELOPE FOLLOWER
130 Oxford Way, Santa Cruz, CA 95060
(408) 423-1561
Contact: Kevin Monahan, Gen. Mgr.
Date Product Introduced: October 1978.
Product Description: The Model 101 is a comprehensive set of signal analyzing and processing functions, which include an exceptionally accurate 1v/oct pitch to voltage converter, a fundamental frequency pulse wave, linear and log envelope followers, a low noise mic preamp, compressor, and variable sensitivity gate and trigger outputs. Accessories include a pitch-sustain footswitch, Moog trigger adaptor and 19 inch rack mounting brackets. The unit measures 17" x 2⅝" x 9¼".
Recommended Usages: The Model 101 allows the musician to control any standard synthesizer using the pitch, amplitude, and articulation nuances of monophonic sounds or instruments. It allows the engineer to use recorded sounds to control delay and feedback settings on voltage controlled delay units, harmony settings on harmonizers, or in conjunction with vocoders so that the carrier will track the modulating signal. The compressor allows for unique synthesizer processing of the signal, controlled acoustic feedback, or dynamic reversal.
Specifications: Tracking range: 26 Hz to 20 KHz,
1v/oct tracking accuracy: within 4mv (1/20th semitone) 200 Hz to 3 KHz.
New pitch acquistion time: 2 cycles of input signal.
Suggested List Price: $549.00

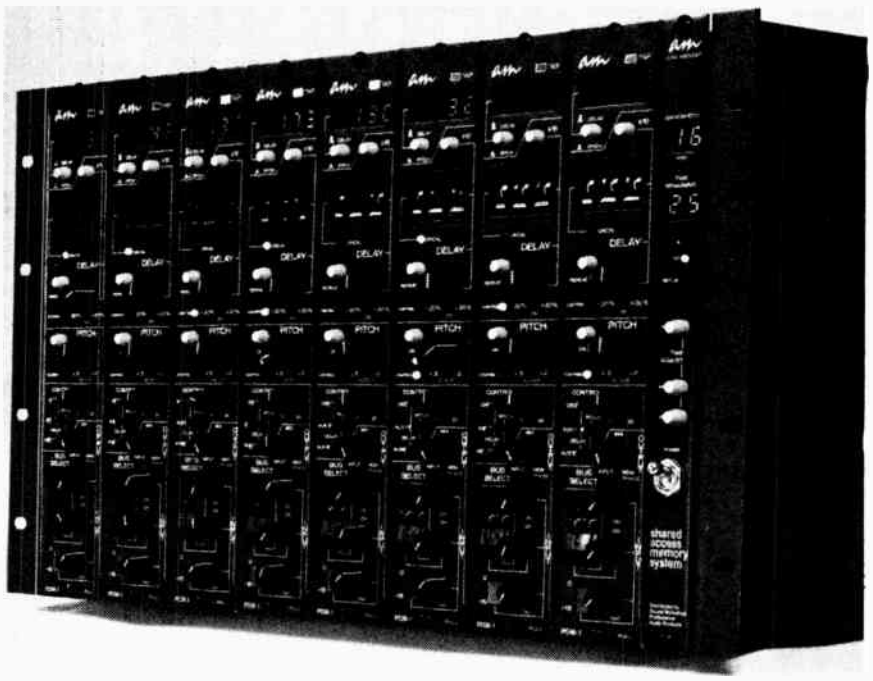
EXR Corporation
EXR Exciter (EX-2)

EXR CORPORATION
EXR EXCITER (EX2)
11523 Dexter-Pinckney Rd., Pinckney, Mich 48169
(313) 878-9445
Contact: James Cassily, Marketing Director
Date Product Introduced: May 1979.
Product Description: The new EX2 offers the same four different enhancement settings per channel as the original EXR Exciter. The EX2 has both internal and external mixing capabilities in a new chocolate brown package.
Recommended Usages: Designed for professional recording studio, broadcasting, motion picture, television, and sound reinforcement applications, the stereo unit restores the natural presence, clarity, fullness and individual signal separation lost in the audio reproduction chain. With a S/N ratio of 89dB, its operational simplicity, and its avoidance of the use of distortion, the EX 2 may be used in either cutting wet or in the mixing stage.
Specifications: The input is at 50K ohm, and the output is 600 ohm, unbalanced line. In mix mode the output is unity gain. Each of the four enhancement settings are different combinations of selective phase nothing, time and frequency manipulation and EXR's proprietary psychoacoustic notch replacement and octave juxtapositioning.

HAMMOND INDUSTRIES INC.
KLARK-TEKNIK DN34
155 Michael Drive, Syosset, New York 11791
(516) 364-1900
Contact: Jack Kelly, Sales Manager
Date Product Introduced: November 1978.
Product Description: The DN34 is an Analogue Time Processor capable of producing numerous time related effects. Among others, these effects include flanging, phasing, double and triple tracking, vibrato, doppler/leslie and chorus. The design of the DN34 incorporates a compander and peak limiter so the effects can be achieved cleanly and noiselessly. All of the effects can be achieved without a need for additional outboard equipment and/or mixer console facilities.
Recommended Usages: Recording studios, broadcast, sound reinforcement, where clean, accurate time delay is a necessity.
Specifications: Frequency response: 30 Hz - 15 KHz ± 1.0dB.
THD: typically 0.2% at 1KHz Maximum 0.5% at 1KHz, 2dB below max. level.
Dynamic range: 90dB (95 typical).
Maximum delay time: 53mS (26.5 per channel).
Doppler (Continuous time sweep) Range: 70:1 (over 6 octaves).

The Mix CLOSE-UP

The Shared Access Memory System



The Shared Access Memory System is an innovative digital processor designed and manufactured by Audio Machinery Corporation.

Shared Access Memory is the first studio oriented digital processor to:

1. Offer 16 bit digital resolution
2. Permit partitioning or sharing of Random Access Memory
3. Offer a pitch-modulation system with high performance standards
4. Allow for future expansion of function and time (and quality if new techniques become feasible)
5. Offer up to 6 seconds of delay capability without comitting the RAM to a single channel or function.

This system consists of two sections; the Mainframe, and the modules. The Mainframe is a 10-1/2 inch rack-mount device which contains 400 millisecond of Random Access Memory (up to 14 additional 400ms cards may be added), a computer to control the "housekeeping" of the system, a master control panel that displays and permits control of the available "time" and the system bandwidth, and a power supply to provide the juice.

Various modules are available that plug into the Shared Access Mainframe to provide specific function(s) and the user controls that tell the computer what it is supposed to do. The modules include:

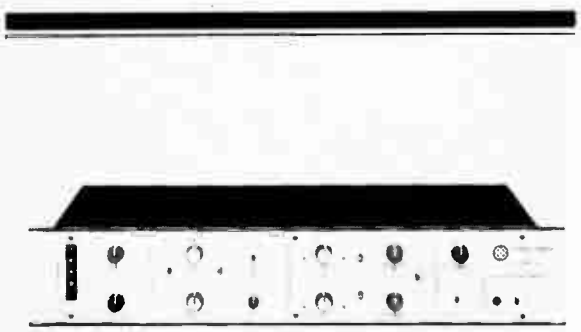
1. Delay
2. Pitch shift with delay
3. Output (adds 3 delayed outputs to any other module)
4. Reverberation (occupies 2 Mainframe ports)
5. Computer interface (to couple the system with automation or an external computer

The Mainframe will accept up to 8 modules. The analog-to-digital converters resolve the audio signal into 16 digital bits, and do not incorporate any signal processing techniques such as companding or pre/de-emphasis.

The Shared Access Memory System is marketed exclusively by Sound Workshop Professional Audio Products, Inc., 1324 Motor Parkway, Hauppauge, NY 11787, 516-582-6210.

Signal Processing Devices

Flange notch cancel: 90 dB.
Input Impedance: electronically balanced (or unbalanced) 20K ohms nominal.
Output Impedance: electronically balanced less than 30 ohms to drive 600 ohm load.
Nominal input level: + 4dBm.
Output level; + 4 dBm to + 18 dBm. Adjustable.
External control voltage; ± 5v (bipolar).
Suggested list price: The DN34 has a retail price of $1600.00



Klark Teknik
Model DN-34 Analogue Time Processor

IBANEZ
THE IBANEZ AD-3000 ANALOG DELAY AND MULTI-FLANGER
P.O. Box 469, Cornwells Heights, PA 19020
(215) 638-8670
Contact: Jeff Hasselberger, marketing Director
Date Product Introduced: June 1979
Product Description: The AD-3000 is a professional analog delay line and a flanger housed in one unit. The two devices operate independently of each other sharing a common power supply and chassis. Separate Lo-Z and Hi-Z inputs and outputs are provided for each device. The delay features wide bandwidth, two bands of equalization and pitch modulation. Each device has three level input padding, a sensitivity control, separate effect and normal output level controls and headroom LED displays.
Recommended Usages: The AD-3000 is at home in the studio or on stage and provides a full range of delay and flanging effects including doubling, slapback, pitch bending, vibrato and double tracking. The completely separate delay and flanger sections slow the versatility of using them in any series or parallel configuration, or using two different instruments or channels.
Specifications: Inputs: Hi-Z 100K ohms unbalanced, ¼" phone jack + 20/0/ – 20 dBm. Lo-Z 600 ohms differential amp balanced, XLR connector + 20/0/ – 20 dBm.
Outputs: Hi-Z 10K ohms unbalanced, ¼" phone jack – 20 dBm.
Lo- 600 ohms, differential amp balanced, XLR connector – 20 dBm.
Distortion: Dry less than 1.5% at 1K hz - 10 dBm (600 msec).; Delay less than 1.0% at 1K hz - 10 dBm (300, 150, 75, 36, 18 msec).
Input Noise: – 105 dBm (Input shorted IHF A curve).
Delay EQ: Bass ± 12 dB at 70 Hz, Trble ± 12 dB at 7 KHz.
Delay Ranges/Bandwidth: Flanger 1-16ms 8KHz, Delay 9-18ms 8 KHz, 18-37ms 8 KHz, 37-75ms 8 KHz, 75-150ms 8 KHz, 150-300ms 8KHz, 300-600ms 4 KHz.

MARSHAL ELECTRONIC
MARSHALL MINI MODULATOR
1205 York Rd., Suite 14, Lutherville, MD 21093
(301) 484-2220
Contact: Pirkko Pulso P.R.
Date Product Introduced: May 1979.
Product Description: New high speed programmed multi tapped delay line / special effects unit.
Studio quality time modulation effects, with new ease and speed of use. Information needed to set up each effect is kept in Internal digital memories. You simply touch a key pad and the unit programs itself correctly for the desired effect, instantly and reliably. Extremely wide range of high performance special effects, plus echo.
Recommended Usages: This unit is designed to offer a very wide range of special effects including many special flanges, ADT, vibrato, etc; and high quality echo and delay. All effects are full studio quality, now formatted for maximum ease of use. Single keypad controls call up digital memory of each effect: switching and adjusting for each effect is done automatically inside the unit. Fast, simple set up and repeatability of studio effects in studio and on stage.
Specifications: High level (studio) inputs and outputs, low level (musical instruments) inputs and outputs, complete remote facilities.
Digital effects in/out function for all effects make this unit a natural in studio and stage applications.
Two filter settings: 15 KHz and 7.5 KHz.
Dynamic Range: Better than 93dB at all delay times (not a bucket brigade delay system).
Delay: Up to 250 mS in basic format, expandable.
Built in power supply.
Simplified time modulation for under $1000.00

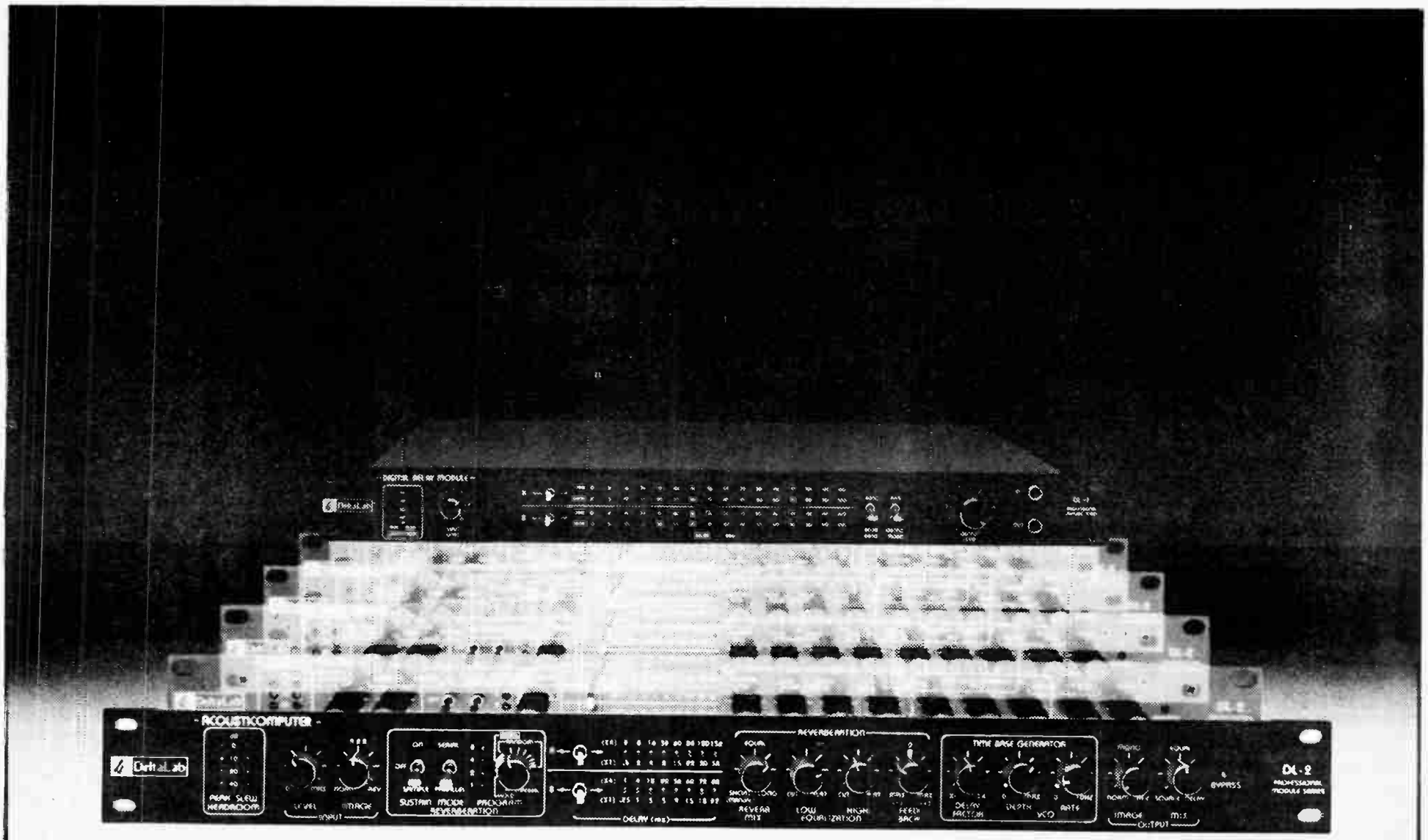
MICMIX AUDIO PRODUCTS, INC.
DYNAFLANGER (MODEL 265)
2995 Ladybird Lane, Dallas, TX 75220
(214) 352-3811
Date Product Introduced: (Original 1978) Significantly improved — AES, May 1979.
Product Description: Dynaflanger is a unique special effects device capable of producing dynamically controlled effects ranging from subtle enhancements to the dramatic or even bizarre, all automatically in relationship to the program material being processed. This year the Dynaflanger features several design changes which significantly improve its operational capability. A substantially greater flanging depth is readily apparent and a unique recycling feedback capability has been provided which further expands the already wide versatility of this device. No change has been made in the manual, swept modulator or external control capability.
Recommended Usages: Dynaflanger's unusual capability to provide dynamic, automated effects control relative to the instantaneous frequencies or peak amplitudes of the program material being processed makes it applicable to almost an aspect of recording or sound reinforcement. Hard flanging, pitch bending, pitch doubling, track thinning, spacey flanging, doppler shift modulator flanging are but some of the effects. Units may also be used in control coupled pairs for an exceptional variety of stereo effects of which Dynamic Cross Flanging is one of the most pronounced.
Specifications: Input Impedance: 47K / 600 ohms bal and floating.
Input Level Range: – 40 to + 18 dBv.
Output Impedance: Less than 10 ohms unbalanced or 40 ohms balanced and floating.
Output level: + 18 dBm maximum into 600 ohms.
Direct Signal Frequency Response: 20 Hz - 20 KHz (ref 1 KHz), + 0, – 2 dB.
Delayed Signal Frequency Response: 20 Hz - 13 KHz (ref 1 KHz), + 0, – 3 dB.
Direct Signal Distortion at + 18 dBm output, 200 - 20k Hz: 0.03%.
Delayed Signal at 1 KHz, Delay midpoint: Less than 0.4%.
Direct Signal Residual Noise: – 95 dBm (A).
Delayed Signal Residual Noise: – 75 dBm (A).
Internal Delay Time Range: 0.26 to 6.4 ms.
Comb Filter Notch Depth: 50 dB typical.
Suggested List Price: $895.00

MICMIX AUDIO PRODUCTS, INC.
MINIATURE MASTER-ROOM (MODEL XL-305)
2995 Ladybird Lane, Dallas, TX 75220
(214) 352-3811
Date Product Introduced: AES, Los Angeles, May 1979.
Product Description: With the introduction of the SL-305 Miniature Master-Room reverberation unit, MICMIX Audio Products extends the Natural Sound Ambience characteristics of its original master-Room design into a compact, lightweight, completely self-contained unit. Inside the 3½ inch rack mount chassis is a totally new Sound Chamber design of exceptional smoothness, even under the most demanding transient signals. The stereo unit features LED peak indicators, four-band equalization, direct signal mix controls and a set of auxilliary input/output jacks on the front panel for added versatility. Despite its lower price, the Miniature Master-Room utilizes conductive plastic type panel controls, plug-in IC sockets and the other quality components throughout that have made Master-Room designs so rugged and reliable.
Recommended Usages: The XL-305 compliments rather than replaces the larger Master-Room models. Its compact design makes it particularly applicable to the smaller studio or on tours, as well as for basic sound reinforcement. It can be operated in full stereo, full mono, mono drive/stereo return, or stereo drive/mono return. No internal limiting is utilized and no external limiting of input signal is required in operating the XL-305 with its inherent response smoothness.
Specifications: Input Impedance: 10K ohm active balanced (600 ohm trans. opt.).
Input Level: Front panel control: infinity to + 18 dBv.
Output Impedance: Below 10 ohms unbalanced, (600 ohm transformer option).
Equalization: Four sections per channel, 12 dB boost or cut at 150, 600, 2K and 6K Hz.
Residual Noise (reverberant signal): – 70 dBm, unweighted.
Nominal Decay Time: 3.5 seconds.
Peak Indicators: at – 6, 0, + 6 dB reference a 0 operating level.
Connectors: Barrier strip rear panel, phone jacks front panel.
Power: 115/230 Volts, 50 - 60 Hz, switchable.
Size: 3½ x 19 x 11 inches deep.
Weight: 10 lbs.
Suggested List Price: $1100.00 approx.

OPAMP LABS, INC.
MODEL 1155 REVERB
1033 North Sycamore Ave., Los Angeles, CA 90038
Contact: Bel Losmandy.
Date Product Introduced: August 1978.
Product Description: Mono Reverb Spring system for line level operation. The system is make up of dual 14 inch reverb spring assembly.
SPECIFICATIONS: Bandwidth is 50 cycles to 6 KHz.
Input is fed to amplitude limiter and constant current generator.
The insertion loss amplifier utilizes a mic preamp.
The Model 522 power supply supplies the bipolar 24V to operate the system. Packaged in an enclosed 3¼" high x 17" wide x 9" deep aluminum enclosure.
Weight: 8 lbs.
Suggested List Price: $275.00

ORANGE COUNTY ELECTRONICS INTERNATIONAL INC.
DEQ PARAMETRIC EQUALIZER
c/o Parasound Inc.
680 Beach St., Suite 414, San Francisco, CA 94109
Contact: Sid Goldstein, Marketing.
Date Product Introduced: March 1979.
Product Description: The new DEQ Parametric Equalizer module is a four-band parametric equalizer using "Constant-Q" curves which is capable of creating 60 dB narrow-band notches in each of its four sections. The depth of the notch is continuously adjustable. Unlike other "dipper-type" equalizers, each section may also be used as a regular program equalizer with a full 20 dB boost per section. Center frequencies tune over a 20 Hz to 20 KHz range; bandwidth is adjustable from .15-3 octaves (Q = 10 - 0.33). The DEQ module offers signal-to-noise of 110 dB with all sections in 20 dB boost; distortion is 0.05% THD at 18 dBm output. An overload indication warns of overload at any point in the circuit.
Recommended Usages: The DEQ Parametric Equalizer is available in either mono or stereo rack mount format or single channel desk housing. It is recommended for applications where a very flexible equalization is required, particularly with an emphasis on notch filtering capabilities. This includes recording studios, broadcast production houses, disc mastering, cassette duplication, film sound, and sound reinforcement. It can also be used as part of the Orange Count VS-1 Stressor which would then offer the functions of peak limiter, compressor, expander/noise-gate, parametric equalizer, and notch filter, all in one 19" rack mount package.
Specifications: Input: 10K balanced, 600 ohm termination switch.
Output: 100 ohm balanced/unbalanced switchable.
Maximum Output: + 30 dB (10K load); + 24 dB (600 ohm load).
System Gain: Unity.
Power 36/48 CT 50 - 400 Hz 5W.
Suggested List Price: $555.00 for single module.

ORANGE COUNTY ELECTRONICS INTERNATIONAL INC.
FR-2 DESK HOUSING
c/o Parasound Inc.
680 Beach St., Suite 414, San Francisco, CA 94109
(415) 673-4544
Contact: Sid Goldstein, Marketing.
Date Product Introduced: March 1979.
Product Description: The FR-2 Rack Frame is designed as a desk housing to hold a single Orange County module, whether it be any of the three equalizers or the CLX, Compressor/Limiter/Expander, module. As such it is highly efficient and can move from studio to studio or within different areas of the studio. The FR-2 contains built-in power transformer and XLR connectors on the rear of the module.
Recommended Usages: To be used in recording studios, broadcast production facilities, film sound, or cassette duplication where a single Orange County module is required rather than



How's THIS for an encore?

Modern Recording called our DL-1 Delay "probably the best we have encountered" . . . a tough act to follow.* Now after more than a year in development DeltaLab introduces its encore - the ACOUSTICOMPUTER® - a combination digital-delay and special-effects processor designed for use both on-stage and in the studio, providing well-known functions (echo, doubling, chorusing, vibrato, flanging, etc.) plus new effects not available in any other device.

- Pre-reverb delay with two independent delay channels, variable from 0.25ms to 152ms with LED display.
- Delay up to 240ms in serial (mono) mode.
- Built in VCO with external control input at rear.
- Same no-compromise sound quality as in our DL-1 Digital Delay: Full 20-15 kHz bandwidth at all delay lengths with 90 dB dynamic range.
- Computer-synthesized acoustic space with 16 selectable reverb programs plus a new special effect in which the ACOUSTICOMPUTER scans the 16 programs.
- Two channels in and out. Built in reverb mixing and stereo imaging controls.
- Foot-switch controlled bypass.

It's impossible to describe in this space everything the ACOUSTICOMPUTER does; you'll have to experiment with it yourself. By carefully minimizing the number of separate controls and grouping them logically, we've made it easy for non-engineers to operate the ACOUSTICOMPUTER.

For further information call or write Phil Markham at DeltaLab Research, Inc., 25 Drum Hill Road, Chelmsford, MA 01824 Tel. (617) 458-2545.

*See Modern Recording "Hands On Report," Sept. 1978.

DeltaLab® DeltaLab Research, Inc. 25 Drum Hill Road, Chelmsford, Mass. 01824

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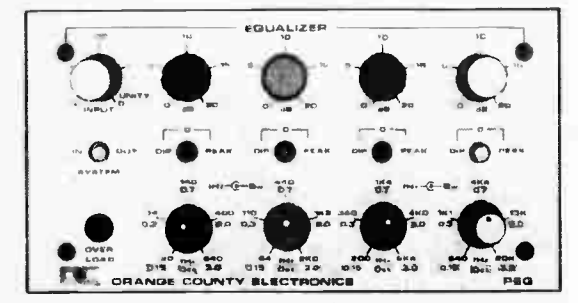
a complete 19" rack system. The FR-2 also allows a complete system to be in operation in one area of the studio, and the FR-2 can house a spare module which can be interchanged as part of the system.
Suggested List Price: $250.00



Orange County Audio
PEQ Parametric Equalizer Module

ORANGE COUNTY ELECTRONICS INTERNATIONAL INC.
PEQ PARAMETRIC EQUALIZER MODULE
c/o Parasound Inc.
680 Beach St., Suite 414, San Francisco, CA 94109
Contact: Sid Goldstein, Marketing.
Date Product Introduced: February 1979.
Product Description: The new PEQ Parametric Equalizer module is a four-band parametric equallzer with center frequency variable from 20 Hz to 20 KHz in overlapping five octave ranges (32:1). Each section tunes over a 40 dB control range. Bandwidth is variable from .15-3 octaves (Q = 10-.33). The PEQ module offers extremely low noise operation. Signal-to-noise is 110 dB with all sections in maximum 20 dB boost. Distortion is 0.55% THD at 18 dBm output. An overload indicator warns of overload at any point in the circuit. Reciprocal curves are used in the equalizer.
Recommended Usages: The PEQ Parametric Equalizer is available in either mono or stereo rack mount format or desk housing. It is recommended for applications where very flexible, "musical" equalization is required. This includes recording studios, broadcast facility production rooms, disc mastering, cassette duplication, and film sound. It can also be used as part of the VS-1 Stressor package which would then offer the functions of peak limiter, compressor, expander/noise-gate, and parametric equalizer (including frequency-sensitive compression) all in one package.
Specifications: Input: 10K ohm balanced, 600 ohm termination switch.
Output: 100 ohm balanced/unbalanced switchable.
Maximum output: + 30 dB (10K load); + 24 dB (600 ohm load).
System Gain: Unity.
Power: 36/48 CT 50 - 400 Hz 5W.
Suggested List Price: $555.00 for single module.

ORBAN ASSOCIATES INC.
526A DYNAMIC SIBILANCE CONTROLLER "DE'ESSER"
645 Bryant St., San Francisco, CA 94107
(415) 957-1067
Contact: John Delantoni, Marketing Manager.
Date Product Introduced: March 1979.
Product Description: The 526A Dynamic Sibilance Controller is an improved single-channel version of the well known three-channel model 516EC. It includes balanced, floating, RF-suppressed inputs and outputs making interface with standard broadcast consoles especially easy. It is equipped with mike or line-level inputs. This new De'Esser effectively removes annoying exaggerated sibilance found in many voices (especially female announcers) without affecting presence or intelligibility, and without adding distortion or other degradations.
Recommended Usages: The 526A is designed to effectively de-ess voice only in recording studio, cinema, broadcast, and other professional applications. Compared to its competition, it offers vastly simpler set-up, improved noise and distortion performance and no emphasis of residual IM distortion while de-essing is occurring. The 526A is directed for use in recording studios, and for motion picture sound and broadcasting.
Specifications: Frequency response: ± 1dB, 20-20,000Hz.
Total Harmonic Distortion (de-essing defeated): ◄0.1%, 30 - 20,000Hz, @ + 18dBm.
Total Harmonic Distortion (de-essing in): ◄0.5% @6kHz.
Output noise (20kHz bandwidth; unity gain with line input): ◄ – 80 dBm; – 85 dBm typical.
Input level variation for constant De'Essing: ►15dB.
Input characteristics: Impedance: ►2000 ohms, balanced bridging (microphone), 10,000 ohms, balanced bridging (line).

Signal Processing Devices

Nominal level: – 60 to – 35 dBm (microphone); – 20 to + 4dBm (line). Gain control is feedback type, and will optimize overload/noise ratio for different input levels.
Maximum voltage gain: + 56dB (microphone); + 18dB (line).
Output characteristics: Impedance: 600 ohms transformer-balanced and floating.
Level: Drive capability into 600 ohms exceeds + 20dBm, 20-20,000 Hz.
Attack time: Approximately 1 ms.
Recovery time: Approximately 10 ms.
Variable-gain element: Junction field-effect transistor.
Suggested List Price: $399.00

ORBAN ASSOCIATES INC.
OPTIMOD-AM, MODEL 9000A
645 Bryant St., San Francisco, CA 94107
(415) 957-1067
Contact: Jesse Maxenchs, Marketing Manager.
Date Product Introduced: August '78.
Product Description: Optimod-AM is an AM audio processing system designed to perfect the listening quality of AM radio broadcasting. Its unique concept permits AM radio to approach the theoretical limits of quality and loudness achievable under existing FCC rules but never before reached in practice. The Optimod-AM "system" comprises in standard audio progression, an Input filter, gated broadband compressor, program equalizer, 6-band limiter, polarity switcher, smart clipper and finally an output filter.
Recommended Usages: The Optimod-AM is used for a variety of purposes — they include increased loudness, to decrease distortion experienced with other available processors. It gives AM audio an increased "punch" on narrow band car radios, while increasing "definition" on wider band radios, while not giving any semblance of audio processing. With Optimod-AM, an operator can make the bass more punchy or mellow. Optimod-AM is AM-stereo ready!
Specifications: Broadband compressor: range of compression: 20 dB; static compression ratio over 200:1.
Program Equalizer: Configurations: 3 equallzer sections: bass, 5kHz, 10kHz.
Six Band Compressor: Configuration: 6 filters: 150Hz LP, 300Hz BP, 700Hz BP; 1.6kHz BP, 3.7kHz BP, 7.5kHz HP.
Polarity Follower: Hysteresis: about 20%.
Peak Limiter: Gain reduction range: better than 15dB; THD: typically below 1% with sine wave.
Suggested List Price: $3995.00

POLYFUSION, INC.
QP-1 SOUND-A-ROUND™ QUAD PANNER
160 Sugg Road, Buffalo, NY 14225
(716) 631-3790
Contact: Alan Pearce
Date Product Introduced: June 1978.
Product Description: The Model QP-1 Sound-A-Round Quad Panner is a unique and extremely useful tool for panning an audio signal around in a quadraphonic environment. The QP-1 provides a fine quality joystick for manual control of sound placement and a patented oscillator which can automatically sweep the sound from channel to channel. The speed and depth of the auto panning is controllable as well as the direction. Speed and depth are also voltage controllable. Four LEDs indicate channel levels, speed and direction.
Recommended Usages: The QP-1 is the perfect sound mover for stage, dance-floor, or studio. The QP-1 can pan, either manually or automatically, any audio signal through four channels. The speed and depth of the panning effect can be controlled remotely with control voltages. The QP-1 can also function perfectly as a quadraphonic balance control.
Specifications: Dynamic Range: 80dB.
Frequency Response: 10Hz - 50 KHz (± 1dB).
Signal Input Level: + 18 dBm (max.).
Speed Range: .05 Hz - 6 Hz.
Control Input Level: 0 to + 5V.
Power Requirement: 90 - 135 VAC, 60 Hz, 130W max.
Dimensions: 10"W x 8.5"D x 4.5"H.
Suggested List Price: $299.95

POLYFUSION, INC.
SP-1 SOUND-A-ROUND™ STEREO PANNER
160 Sugg Road, Buffalo, NY 14225
(716) 631-3790
Contact: Alan Pearce.
Date Product Introduced: June 1978.
Product Description: The SP-1 is a compact yet fully automatic stereo panner. Both the speed and the depth of the panning motion can be precisely controlled with panel controls, and the speed can also be controlled with an optional footpedal or control voltage source. Included with the SP-1 is a footswitch which activates the panner when depressed. An LED provides a clear visual indication of the panning speed.
Recommended Usages: The SP-1 Sound-A-Round stereo panner is ideally suited to any studio or stage application with any electronic or electrified musical instruments. The signal from the instrument will be smoothly "moved" from one stereo channel to the other and back over a wide range of speeds. The SP-1 is perfect any time that quiet, effective, and reliable automatic panning is required in stereo.
Specifications: Dynamic Range: 80 dB.
Frequency Response: 10 Hz - 25 KHz (± 1 dB).
Signal Input Level: + 12 dBm (max.).
Speed Range: 0.1 Hz - 14 Hz.
Control Input Level: 0 to + 5V.
Power Requirement: ± 9V DC from 2 9V batteries.
Dimensions: 8.25"W x 6.25"D x 2.5"H.
Suggested List Price: $99.95

SHOWCO MANUFACTURING CORPORATION
MODEL S-2505 CROSSOVER — ELECTRONIC FREQUENCY DIVIDING NETWORK
1221 Round Table Drive, Dallas, TX 75247
(214) 630-7121
Date Product Introduced: February 12, 1979.
Product Description: The Showco S-2505 series of electronic crossovers utilizes flexible modular design for almost unlimited application. The S-2502/2 two-way stereo and S-2505/3 three-way stereo crossovers are ideal in bi-amplified and tri-amplified systems for clubs, rinks, and discotheques. The S-2505/M is a full two-way stereo crossover with the addition of a derived (L + R) monaural channel for use in the most sophisticated systems employing sub-woofers and tweeter arrays. For example, the S-2505/M may be ordered with an 800Hz crossover point for the left and right bi-amplified full range speakers and a 200Hz low monaural output for driving the sub-woofer channel and a 5000Hz high monaural output for driving the tweeter array channel. All models in the S-2505 series have user specified frequency via plug-in cards and may be ordered with optional output trim controls (internally mounted).
Specifications: Active component compliment insures high slew rate (greater than 12v per u sec.) by using high-impedance BI-FET operational amplifiers for precise filter characteristics and ultra-low T.I.M. distortion. Full output voltage swing (± 10v peak) to beyond 20KHz.
Crossover Frequency: User selectable via plug-in printed circuit cards. Frequency tolerance is ± 5%.
Frequency Response: ± ½ dB within pass-band, 20 - 20 KHz.
Filter Characteristics: 3rd order Butterworth (maximally flat pass-band with – 18dB per octave skirts).
Input Impedance: 10K ohms ± 5% (a 10uf non-polar input capacitor allows bass response to 1.6Hz).
Insertion Loss: ± 1 dB within pass-band (gain is equal to unity ± 1 dB).
Level Indicators: Front panel LED's for the left and right channel confirm on input signal of 30.0 mv RMS or greater.
Output Impedance: 100 ohms nominal (small signal, + 7 dBv).
1K ohms nominal with optional output level controls.
Total Harmonic Distortion: Less than 0.1%.
Intermodulation Distortion: Less than 0.1%.
Signal to Noise Ratio: Better than 90dB (maximum output level related to RMS wide-band residual noise).
Unit Weight: 3 lb. 3 oz. (1.5 kg)
Shipping Weight: 4 lb. 3 oz. (1.9 kg)
Dimensions: 19"W x 6⅛"D x 1¾"H (482.6mmW x 152.4mmD x 44.5mmH)
Suggested List Price: 2-way stereo, $160.00; 3-way stereo, $195.00; 2-way stereo with derived (L + R) monaural outputs. $180.00.

SYMETRIX, INC.
CL-100 COMPRESSOR/LIMITER
109 Bell St., Seattle, WA 98121
(206) 682-3076
Contact: Dane Butcher, Sales Manager
Date Product Introduced: January 1979.
Product Description: The Symetrix CL-100 Compressor/Limiter is a dynamic level controller that offers premium performance and a full compliment of control and interconnect features. Side-chain insertion and sibilance controlling D'Ess functions are provided. Stereo interconnect capability assures stable stereo imaging when two CL-100's are used in tandem. The gain control element is a true Voltage Controlled Amplifier, therefore the CL-100 may be used at compression ratios over 50:1 with no signal degradation or harmonic coloration.
Recommended Usages: The CL-100 is especially useful in both recording and PA applications. Used as a peak limiter, the CL-100 helps prevent overmodulation in recording systems, and power amplifier clipping (and subsequent destruction of horns)

Signal Processing Devices

in PA use. The CL-100 can be used as either a peak or average limiter on individual tracks or entire mixes whenever an effective but transparent gain controller is needed.
Specifications: Total harmonic Distortion: Not greater than .5% at any control setting, at + 18 dBm output.
Maximum output level: + 21 dBm into 600 ohms.
Hum and Noise: Less than −84 dBv measured in a 20 KHz noise bandwidth, input terminated with 50 ohms, unity gain.
Input: balanced, 20K ohms (CL-100B). Unbalanced, 10k ohms (CL-100).
Output: Balanced, 300 ohms (CL-100B). Unbalanced 50 ohms (CL-100).
Attack Time Range: 330 nanoseconds to 1.65 seconds.
Release Time Range: 33 milliseconds to 5 seconds.
Available Gain: 20 dB.
Input/Output Connectors: 3 pin XLR-type (CL-100B), ¼" phone jax (CL-100).
Suggested List Price: $299.00 (CL-100) $349.00 (CL-100B).

UNITED RECORDING ELECTRONICS INDUSTRIES
MODEL 567 PA PROCESSING SYSTEM
8460 San Fernando Rd., Sun Valley, CA 91352
(213) 767-1000
Contact: E.J. Consen, V.P. Marketing
Date Product Introduced: October 1978.
Product Description: Model 567 PA Processing System is a four-in-one signal processing system, which includes: input pre-amp, with built-in pink noise source for setup and level indicator LED's; 10-band Graphic Equalizer; four-frequency Feedback Suppressor; 2-way Electronic Crossover for bi-amping, and a regulated power supply. All in one 19" x 3½" rack mount package.
Recommended Usages: Stage monitor signal processing; public-address and sound reinforcement systems. Cost effective and space saving as compared to individual components. For use with high or low level, high or low impedance mixers or consoles, balanced or single-ended circuits.
Suggested List Price: $696.00 Contact factory for Specs.

WMS AUDIO ENGINEERING
AUTO DOUBLER/TRIPLER MODEL 970-A
LTV Industrial Park, 2333 South, 2700 West,
Salt Lake City, Utah 84119
(801) 972-8869
Contact: Peter A. Lutz, Pres./Eng.
Date Product Introduced: May 1979 AES.
Product Description: The 970-A is a professional audio delay device which performs real time double and triple tracking effects. The 970-A contains two independent delay line with preset modulation for creating startingly realistic doubling and tripling. The unit contains a mic preamp as well as line inputs. Inputs and outputs are available balanced and unbalanced. The front panel controls were designed for simplicity in operation and quick set-up time. The unit is rack mountable. Each delay line can be controlled with external devices such as footpedals, joysticks, synthesizers or other voltage control sources. The internal circuitry is modular in concept and shock mounted for rugged live performance uses.
Recommended Useges: The 970-A was designed to reduce costly studio time when a performer wishes to double or triple track vocals or an instrument. The 970-A is designed to simulate doubling and tripling as realistically as possible in live situations. The 970-A can provide instant doubling and tripling for a vocalist or expand backup vocals. The 970-A can be used with various instruments to add depth and movement to enable the instrument to stand out.
Specifications: Input Impedance: Mic 150 ohms, line balanced 600 ohms, line unbalanced 500K ohms.
Output Impedance: Balanced 600 ohms, unbalanced 100 ohms.
Frequency Response: Direct: 20 - 20 KHz, either delay 20 - 20 KHz.
Signal/Noise: − 90 dBm or better.
Input Level: Line: + 18 dBm.
Mic preamp: up to 40 dB gain.
Size: 19 x 2½ x 8 inches.
Power 110 - 120 VAC 60 Hz, 200 - 220 VAC 50 Hz optional.
Suggested List Price: Approx $500.00 (tentative), price to be available at 1979 May AES Show.

Tape Recorders

ACCURATE SOUND CORPORATION
AS2400 HIGH SPEED TAPE DUPLICATING SYSTEM
114 Fifth Ave., Redwood City, CA 94063
(415) 365-2843
Contact: Don O'Bella, Sales Mgr.; Greg Sargent, Sales Engr.
Date Product Introduced: January 1979.
Product Description: High-speed Tape Duplicating System with advanced motion control, ferrite heads for long life operation and low maintenance. Produces twice as many copies per hour as Ampex 3200 system of the same size. Virtually eliminates crosstalk between channels. Alleviates start-up problems associated with large pancake & delicate .150 tape. Outperforms any tape duplicating system in its class at a lower price and with lower power consumption. Advanced motion control consists of constant holdback tension torque boost take up, optional constant takeup tension and optional slow start, automatic cue option, meter option.
Recommended Usages: Commercial cassette or 8-track duplicating. Military cassette or 8-track duplicating. Security cassette or 8-track duplicating. Law enforcement cassette or 8-track duplicating.
Specifications: System Expansion: Up to 10 slaves max. per master.
Track Formats: Master ¼" 2-channel ¼", 4-channel, ½", 4-channel, 1", 4-channel, 1", 8-channel. Slave .150", 2-channel mono, .150", 4-channel stereo, ¼", 2, 4 or 8-channel.
Tape Speeds: 30/60 ips or 60/120 ips standard; 15/30 ips available on special order.
Reel size: 14" maximum.
Duplication ratios: 4:1, 8:1, 16"1, full band width 32:1 educational applications.
Frequency Response: 7½ ips copies; +1, −2 dB; 50 Hz to 18 KHz. 3¾ Ips copies; + 1-2 dB; 50 Hz to 12 KHz. 1 ⅞ ips copies; + 1-2 dB; 50 Hz to 12 KHz.
Stereo Phase Error: Less than 45 degree at 15 KHz.
System Noise: Better than 3 dB below a blank biased Scotch 176 tape, 1 KHz to 10 KHz (real time).
Overall speed error: 0.5% maximum.
Overall Flutter Contribution: Less than 0.15% RMS NAB weighted.
Suggested List Price: Systems start at less than $10,000.00

ACCURATE SOUND CORPORATION
ASCO #5000 MULTI-CHANNEL RECORDER
114 Fifth Ave., Redwood City, CA 94063
(415) 365-2843
Contact: Don O'Bella, Sales Mgr.; Greg Sargent, Sales Engr.
Date Product Introduced: January 1979.
Product Description: 16 Track prewired for 24 track recorder. Features: DC reel servo capstan DC servo, closed loop dual capstan, automatic locator, remote all functions.
Recommended Usages: Recording Studios.
Specifications: DC reel servo system for constant tension.
Capstan DC servo variable 15 ips ± 10% 30 ips ± 10%.
Closed loop dual capstan.
Automatic locator stores up to 10 locations in memory storage in minutes & seconds for retrieval upon command.
Remote control contains transport control, capstan speed control & audio switching.
Low distortion 0.1% THD at 0VU (+4 dB) corresponds to 250 nWb/M. 12 dB head room at peak record level of +15 dB reference to +4 dB at +15 dB THD 1%. Monitor amp output Z = 600 ohm max. 24 dB with THD ◄ .1% WOW and flutter unweighted ◄.06%.
Signal to noise reference to +4 dB (operating level) 64 dB. Reference to +12 dB maximum level 72 dB.
Crosstalk 16-track better than 55 dB.
Erasure level −70 dB.

AGFA-GEVAERT, INC.
MASTERING TAPE PEM 468
275 North St., Teterboro, NJ 07608
(201) 288-4100
Date Product Introduced: June 1978.
Product Description: High output, low noise, low print tape for mastering. Available in ¼", ½", 1" and 2". 1.5 mil tape on highly tensilized polyester base.

DENON (DISTRIBUTED BY AMERICAN AUDIOPORT)
DR-250 STEREO CASSETTE TAPE DECK
1407 N. Providence Rd., Columbia, MO 65201
Contact: Eric Fossum, VP/National Sales Manager
Date Product Introduced: June 1979.
Product Description: Moderately priced package with stylish, elegant features. Two wide VU meters, single gap Sendust record-playback head, 2 motors, Capstan DC servo and fastwind DC motor, continuous front panel bias adjust, 3 position LH, FeCr, Co tape selector, muted recording/pause button, Timer recording and playback possible, Automatic repeat function, Automatic rewind and memory stop function; Built-in Dolby NR system; 5 LED indicators for transport control indication. Metal tape record/playback compatibility.
Recommended Usages: Very high quality consumer deck with audiophile state-of-the-art recordings possible with metal tape and front panel infinite bias adjust. Auto-repeat is useful for music students and musicians. The timer start makes "absentee" recordings possible when the operator cannot be physically present at the time to tape special radio programs.
Specifications: 35 Hz to 15 KHz (±3 dB) with cobalt tape (metal tape specs not yet available).
Wow and flutter less than .05% Wrms.
S/N ratio more than 62 db (CCIR/ARM, 3% THD, Dolby on, Co tape).
Suggested List Price: $480.00, available July 1, 1979.

DENON (DISTRIBUTED BY AMERICAN AUDIOPORT, INC.)
DR-450 STEREO CASSETTE DECK
1407 North Providence Rd., Columbia, MO 65201
(314) 443-1636
Contact: Eric Fossum VP/Nation Sales Manager.
Date Product Introduced: June 1979.
Product Description: Servo controlled DC motors, 4-position tape selector; front panel infinlte bias adjustment; auto-repeat; auto-rewind and memory stop; timer recording; pause/mute function; Dolby; single-gap Sendust record/playback head; cueing and program search function that advances and rewinds without cutting off the output and automatically locates and stops on inter-program spaces; output level control and input selector switch. Metal tape record/playback compatible. Remote control option available.
Recommended Usages: State-of-the-art audiophile recordings possible. Optional remote control available for small studio applications. Additional usages as per DR-250.
Specifications: 35 Hz to 15 KHz (±3 dB) with cobalt tape (metal tape specs not yet available).
Wow and flutter less than .04% Wrms.
S/N ratio more than 64 dB (CCIR/ARM, 3% THD, Dolby on, Co tape).
Suggested List Price: $620.00, available July 1, 1979.

DENON (DIST. BY AMERICAN AUDIOPORT, INC.)
DENON DX-5 AND DX-3 CASSETTE TAPE
1407 North Providence Rd., Columbia, MO 65201
(314) 443-1636
Contact: Eric Fossum, VP/National Sales Manager.
Date Product Introduced: December 1978.
Product Description: Denon is one of only six original tape manufacturers in Japan. Two configurations are now available. DX-3: LH tape double coated by Denon's own original process. Upper layer is high coercivity magnetic ferric oxide, lower layer is high sensitivity magnetic ferric oxide. The shell has three times the precision of IEC standards. Denon's design aims at reducing 3rd harmonic and IM distortion and at the same time dramatically reduces dynamic distortion which is caused by many signal frequencies interacting. This achievement makes the DX tape an ideal medium for storage and playback of musical signals. DX-5: Double coated ferric-cobalt to be used in FeCr position. Upper layer of cobalt doped high coercivity mag. ferric ox.; lower of high sensitivity magnetic ferric oxide.
Recommended Usages: Recommended for music recordings where very wide dynamic range with high MOL (maximum output level) and low noise are absolute criteria. Especially effective in reproducing musical transients and reducing dynamic distortion.
Suggested List Price: DX-3 C-46 $3.50. DX-3 C-60 4.00. DX-3 C-90 $5.60. DX-5 C-46 $4.50. DX-5 C-60 $5.00. DX-5 C-90 $7.00

MEMOREX CORPORATION
MEMOREX HIGH BIAS CASSETTE
1600 Memorex Drive, Santa Clara, CA 95052
(408) 987-1752
Contact: Elizabeth D. Nash, Sales Promotion Manager.
Date Product Introduced: January 1979.
Product Description: The Memorex High Bias cassette utilizes an advanced ferrite crystal oxide formulation that provides outstanding reproduction when used at the high bias (Chrome-Cro-2) machine setting. Specific performance advantages of Memores High Bias are excellent recording performance at critical high frequencies for brilliant sound reproduction; lower noise and increased maximum output levels for excellent signal-to-noise ratio; and the ability to record at high levels without saturation, resulting in a wide dynamic range and broad recording flexibility. The new cassette is being offered in a distinctive new album (patent pending) that incorporates several exclusive convenience features, including a unique built-in hub lock system that allows the cassette to be inserted into the album in either direction. The Memorex High Bias cassette is available in 60 and 90 minute lengths.
Recommended Usages: Memorex High Bias is recommended for use on all tape recording machines at the high bias (Chrome/Cro-2) machine setting.
Suggested List Price: High Bias 60 minute cassette: $4.39. High Bias 90 minute cassette: $5.99

MEMOREX CORPORATION
MEMOREX MRX-3 OXIDE CASSETTE
1600 Memorex Drive, Santa Clara, CA 95052
(408) 987-1752
Contact: Elizabeth D. Nash, Sales Promotion Manager.
Date Product Introduced: June 1978.
Product Description: The Memorex MRX-3 oxide cassette utilizes an improved ferric formulation to provide outstanding sound reproduction on all types of tape recorders without the need for special biasing. Specific advantages of the MRX-3 oxide cassette are lower distortion for superior high-level recording, low noise and increased maximum output for excellent signal-to-noise ratio, and higher output at saturation resulting in wider dynamic range and broader recording flexibility. The MRX-3 cassette is available in a wide range of lengths — 30, 45, 60, 90, and 120 minutes.
Recommended Usages: The Memorex MRX-3 cassette is recommended for use on all types of recording equipment without the need for special biasing.
Suggested List Price: MRX-3 C-30 minute: $2.95. C-45 minute: $2.79. C-60 minute: $2.99. C-90 minute $4.49. C-120 minute: $5.99.

Tape Recorders

OTARI CORPORATION
MTR-90 MASTERECORDER
981 Industrial Rd., San Carlos, CA 94070
(415) 593-1648
Contact: Steve Krampf, Nat. Sales Manager
Date Product Introduced: May 1979 (Spring AES show in LA.)
Product Description: Otari has made its entry into the world of professional 16 and 24 track state-of-the-art recording with its introduction of the MTR-90. The MTR-90 reflects the leading edge of currently available technology by incorporating a fully symmetrical tape path utilizing a pinch-roller-free direct drive capstan.
Recommended Usages: A transport/channel remote is standard with the MTR-90. Introduction of the remote at the LA AES along with an optional 10 memory tape location device (with full shuttle capabilities) will position the MTR-90 as the most functional multitrack on the market.
Specifications: 3 versions will be available: 16, 16 wired for 24, and 24.
Other features include: electronic cueing of tape by use of front panel fader, ±20% speed variation (calibrated in tenths of a percent).
Timed electronic inserts for gapless and noiseless punches (automatic compensation for vari-speed).
Rear panel access for interface with SMPTE synchronizers and tape motion controllers.
Single card electronics and more.

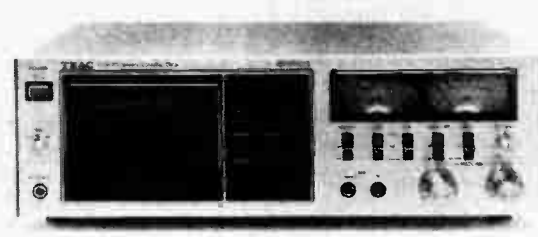
Otari Corporation
Model MTR-90 16/24 Masterecorder

(WILLI STUDER SWITZERLAND)
STUDER REVOX AMERICA, INC.
STUDER A80MR, STUDER A80QC
1819 Broadway, Nashville, Tenn 37203
Contact: B. Hochstrasser, President.
Date Product Introduced: November 1978.
Product Description: A80MR: 3¾/7.5 ips Master Recorder with special heads for Master tape production for 32:1 and 64:1 duplicators. All commonly used formats available.
A80QC: Quality control machine for cassette tape pancakes. High performance electronics, bi-directional play mode, switchable equalization, speed: 1⅞ ips. Record facilities optional available.
Recommended Usages: Duplicating plant requiring highest possible standards in making duplicating masters and have very tight quality control on end product.
Suggested List Price: A80MR $13,900.00 - $23,595.00 depending on format.
A80QC $12,850.00 - $13,425.00 depending on options.

(WILLI STUDER SWITZERLAND) STUDER REVOX AMERICA, INC.
STUDER A80RC-0. 75 SVU / B67-0.75 SVU
1819 Broadway, Nashville, TN 37203
(615) 329-9576
Contact: B. Hochstrasser, President.
Date Product Introduced: March 1979.
Product Description: Mono/stereo compatible Recorder/Reproducer. Switchable to Mono or stereo. Utilizes the Studer 0.75 Butterfly heads for mono campatibility and extra flat frequency response. Full track erase head.
Recommended Usages: Anywhere where mono and stereotapes have to be recorded or played back with the same machine. Fully compatible with tapes made on North American machines.
Specifications: Basic specifications same as B67 or A80RC.
Suggested List Price: B67-0.75 SVU portable $4,950.00
B67-0.75 SVUK console $5,465.00
A80RE-0.75 SVU console $8,985.00

TEAC CORP. OF AMERICA
MODEL 124 SYNCASET
7733 Telegraph Rd., Montebello, CA 90640
(213) 726-0303
Contact: TEAC Consumer Relations
Date Product Introduced: April 1979.
Product Description: The 124 Syncaset is our first cassette deck with true overdub recording capabilities. You can mix Mic & line inputs and add a Mic signal to the tape output. In normal operation as a standard cassette it is also an excellent performer.
Recommended Usages: There are many ways to use the Sync function on this unit. Applications include songwriting, language and music instruction. The Sync works this way: Record first part on the left channel, then monitor it's playback while recording new part on the right. In final playback, both parts are perfectly syncronized, and you can add a Mic to the output. The cross-feed function blends the channels together slightly for a better stereo image.
Specifications: Frequency Response: 30 - 16,000 Hz (w/Cr02) ±3 dB (overall).
Wow & fluter: 0.07% (NAB WTD).
S/N 55 dB w/out Dolby; 65 dB w/Dolby over 5 KHz.
Suggested List Price: $450.00

TEAC Corporation of America
Model 124 Syncaset



TEAC Corporation of America
Model A-500

TEAC CORP. OF AMERICA
A-500 & A-510 CASSETTE DECK
7733 Telegraph Rd., Montebello, CA 90640
(213) 726-0303
Contact: TEAC Consumer Relations.
Date product Introduced: April 1979.
Product Description: This rack-mountable cassette deck features full-logic controlled transport system, Record Mute function, memory rewind, 3-position bias & EQ, Peak reading meters, Dolby noise reduction, and variable input and output level controls. It also has a timer function that allows playing or recording at a preset time when used with an external AC-timer.
The A-510 offers the identical features with the audition of LCD Bar Graph Meters.
Recommended Usages: Studio people have been asking us for a mid-priced high-quality performer in the cassette format that is rack-mountable. Here it is. The light-touch controls afford you with quick, positive operation. Peak-reading dB meters allow careful level setting for copying those hot studio masters.
Specifications: Frequency Response: 30 Hz - 16 KHz ±3 dB with Cr02 & FeCr02 (overall).
Wow & flutter: 0.06% (WRMS).
S/N: 56 dB w/out Dolby, up to 65 w/Dolby over 5 KHz.
Inputs: 2 line 60mV/50K ohms or more; 2 Mic 0.2rmV (−72dB), 600 ohms or more.
Outputs: 2 line 0.3V/10K ohms or more; 1 Stereophone Jack 8 ohms.
Suggested List Price: A-500 $425.00; A-510 $475.00

TEAC Corporation of America
Model 35-2 Mastering Recorder/Reproducer

TEAC/TASCAM
35-2 MASTERING RECORDER/REPRODUCER
7733 Telegraph Rd., Montebello, CA 90640
(213) 726-0303
Contact: TEAC Consumer Relations
Date Product Introduced: January 1979.
Product Description: The 35-2 is a professional half-track stereo mastering deck featuring heavy-duty precision transport, pitch control, flip-up head cover, variable bias & EQ, extra ¼-track playhead, and optional dbx interface. The twopiece unit is rack-mountable and comes with wooden side panels. The meters are VU's with peak dB LED's.
Recommended Usages: This unit, having the finest transport in a half-track that TEAC/Tascam has ever produced, is quickly finding its way into the studios.
Specifications: Tape Speeds: 15 ips & 7½ ips.
Wow & flutter: 0.03% at 15 ips (NAB WTD) 0.06% at 7½ ips.
Frequency Response (overall): 40 Hz - 22 KHz ±3 dB/OVU at 15 ips; 40 Hz - 18 KHz ±3 dB/OVU at 7½ ips.
S/N: 100 dB with dbx, 65 dB without (3% THD level STD).
Stereo separation: 50 dB/1 KHz.
Inputs: 2 line - 24 dB (60mV)/50K ohms.
Outputs: 2 line - 7 dB (0.45V)/10K ohms; 1 stereophone jack — −21 dB/8 ohms.
Suggested List Price: $1900.00

TELEX COMMUNICATIONS, INC.
INT-1 INTERSPERSER
9600 Aldrich Ave. So., Minneapolis, MN 55420
(612) 884-4051
Contact: Don Mereen, Director Mktg. Pro Audio.
Date Product Introduced: April 1979.
Product Description: The Telex INT-1 Intersperser provides manual or automatic selection between two audio sources. It will switch mono or stereo audio, AC power and the control circuitry to start or stop each source. Switching can be done manually or automatically timed.
Recommended Usages: Alternating between two music sources to vary program content. Insetting advertising messages in programmed music to highlight special information. Can be used wherever background music is utilized.
Specifications: Size: 9.5"W x 10.5"D x 3"H.
Weight: 3.5 lbs.
Available in 95 - 150 VAC, 60 Hz or 190 - 280 VAC, 50 Hz.
Suggested List Price: $275.00

Tape Recorders

TELEX COMMUNICATIONS, INC.
230L LOGGER
9600 Aldrich Ave. So., Minneapolis, Minn 55420
(612) 884-4051
Contact: Don Mereen, Director Mktg. Pro. Audio.
Date Product Introduced: September 1978.
Product Description: Heavy duty two speed, three motor electrically operated relay and solenoid controlled tape transport, suitable for remote control operation. Records over 12½ hours of information on 3600 ft. of tape at 15/16 ips; over six hours at 1⅞ ips. Available in one, two, or four channel configuration with professional solid state record/reproduce preamplifiers.
Recommended Usages: Broadcast logging, telephone messages, fire or police dispatcher record, surveillance, medical emergency room or analog recording in surgery, court reporting and transcription or space and military analog recording.
Specifications: Reel size: 7" max.
Tape Speeds: 15/16 and 1⅞ ips.
Flutter and Wow: 0.5% RMS at 1⅞ ips.
Power Requirements: 150 watts max. 117 vac, 60 Hz.
Dimensions: 19"W x 10½"H x 7⅞"D.
Weight: 22 lbs.
Suggested List Price: From $1215.00

TELEX COMMUNICATIONS, INC.
TMM-150
9600 Aldrich Ave. So., Minneapolis, MN 55420
(612) 884-4051
Contact: Don Mereen, Director Mktg. Pro Audio.
Date Product Introduced: February 1979.
Product Description: The Telex TMM-150 is a monaural tape playback system utilizing programmed music tape cartridges. The unit includes built-in facilities for paging and its flexibility makes it suitable for virtually all industrial, commercial, and professional continuous duty music applications. The TMM-150 uses standard broadcast (NAB type) endless loop tape cartridges. Non-repetitive programs exceeding 10 hours can be accomodated in a single cartridge.
Recommended Usages: Use in restaurants, shopping centers, hospitals, passenger terminals, banks, offices, beauty salons, motels, waiting rooms, etc. to create an atmosphere or mood, develop a theme, for therapeutic value, to relieve monotony/improve efficiency for masking, and also for entertainment.
Specifications: Compatible with NAB type AA, BB and CC Cartridges.
Tape Speed: 1⅞" ips.
Frequency Response: Tape 50 - 8000 Hz ± 4 dB.
Signal to Noise Ratio: 48 dB below 3% THD.
Dimensions: 8"H x 15"W x 12½"D.
Weight: 30 lbs.
Suggested List Price: $750.00

U.S. PIONEER ELECTRONICS CORP.
CT-F800 FRONT LOADING DOLBY (R) CASSETTE TAPE DECK
85 Oxford Drive, Moonachie, NJ 07074
(201) 440-8100
Contact: R.I. Petty, Prod. Information
Date Product Introduced: January 1979.
Product Description: Compact front-access stereo cassette deck with Dolby (R) features 2 motors. 3 heads, closed-loop dual capstan transport and electronically-controlled DC Servo motor for capstan drive, DC high torque motor for fast forward and rewind. Also has Fluroscan peak/average level indication, Sendust combination head, electronically controlled soft touch switches, bias control knob and automatic chrome tape sensing device.
Specifications: Wow & flutter: 0.045% (WRMS).
S/N ratio: 64dB (Dolby on).
Freq. response 25-18,000Hz (chrome tape).
Suggested List Price: $450.00.

The Mix CLOSE-UP

OTARI MTR 90 16/24 TRACK

Otari has made it's entry into the world of professional 16 and 24 track state-of-the-art recording with it's introduction of the MTR-90. The MTR-90 incorporates a fully symmetrical tape path utilizing a pinch-roller-free direct drive capstan.

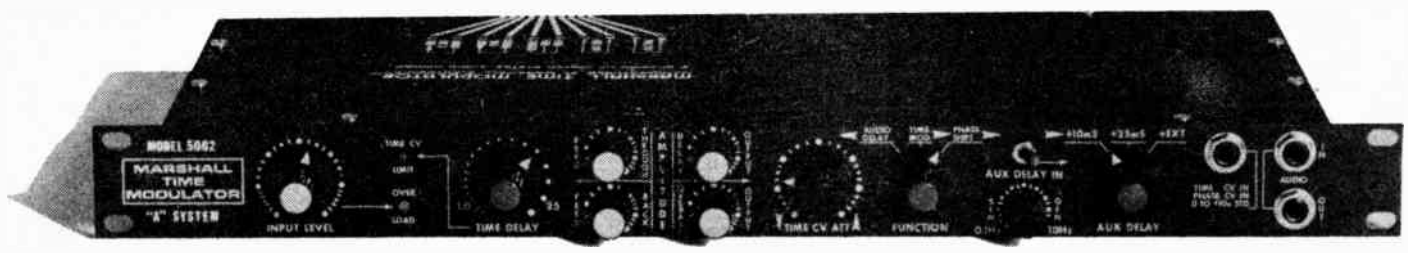
A phase lock loop DC servo system for all three transport motors insures intimate tape to head contact with constant tension while eliminating tape stretching. In fast wind modes the capstan totally controls operation allowing a good tape pack under all conditions.

A transport/channel remote is standard with the MTR-90 and will be introduced at the L.A. AES along with an optional 10 memory tape location device (with full shuttle capabilities).

Other features include: electronic cueing of tape by use of front panel fader, ±20% speed variation (calibrated in tenths of a percent), timed electronic inserts for gapless and noiseless punches (automatic compensation for vari-speed), rear panel access for interface with SMPTE synchronizers and tape motion controllers and single card electronics.

Three versions will be available, 16, 16 wired for 24, and 24. Otari's best guess on initial deliveries is 60 days folowing the L.A. show. Pricing is not firm as of this moment but the ball park price is in the same range as the competitors from Ampex, MCI and 3M. Firm pricing will be available at AES.

THE MARSHALL TIME MODULATOR™



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Now available! The ideal digital timer for clocking studio sessions, timing checks, elapsed time for songs and any other time measurements.

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The START, STOP and RESET functions may easily be remotely controlled from your console or panel by connecting normally-open, fast-action switches to the rear terminal strip of the unit.

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Accessories & Other Equipment

ACCURATE SOUND CORPORATION
THE NEW STARBIRD BOOM
114 Fifth Ave., Redwood City, CA 94063
(415) 365-2843
Contact: Don O'Bella, Sales Mgr., Greg Sargent, Sales Engr.
Date Product Introduced: Original introduced 1936; Updated '79.
Product Description: Deluxe Studio Boom. The original Starbird Microphone Boom was designed in 1936 by George A. Starbird. The detailed design and function of the boom incorporated both features necessary to meet the expanding and demanding needs of the recording industry. Over the years the markets have changed and the quality of the boom and its reputation has been enhanced until now it is considered to be a standard of quality by the recording industry, which is its current prime market.
Recommended Usages: Recording studios, broadcast studios, audio-visual, film studios, TV studios, industrial, military, aerospace.
Specifications: Operational features are 180 degree quadrant allows for complete vertical flexibility in that the microphone can be placed from floor level to 16 feet high.
The horizontal mounting allows 360 degrees horizontal rotation and microphone facing.
The vertical tubes have a maximum extension of 9 feet and the horizontal tubes have a reach of 8 feet.
The three-legged counter balancing base weighs 30 pounds and is mounted on large ball bearing rubber tired casters so that the boom can be moved easily, freely and most important of all, noiselessly.
All major parts are aluminum except the base and counter weight.
The aluminum tubes are centerless ground to allow the smoothest possible action in positioning a microphone silently anywhere within its range.
Precision machined parts to exacting tolerances and rigid inspection prodcedures remove this boom from the classification of mass produced competitors.
All painted surfaces are textured poline to further give a quality product a quality appearance.
Suggested List Price: $595.00

ACCUSTILOG, INC.
VCC-1 TIME DELAY SPECTROMETRY OSCILLATOR
19 Mercer St., New York, NY 10013
(212) 925-1365
Contact: Alan Fierstein, President.
Date Product Introduced: December 1978.
Product Description: The Acoustilog VCO-1 is a highly stable voltage controlled oscillator designed specifically for use in Time Delay Spectrometry (TDS). Used in conjunction with a spectrum analyzer and a frequency counter, it provides control over the time-delay distance and thus enables acoustic events to be measured. The VCO-1 is battery-powered and is self-contained in a miniature diecast aluminum case.
Recommended Usages: Anechoic speaker and microphone measurements In ordinary rooms; viewing of early and late reflections separately; measurement of absorption spectra.
Specifications: Controls: Power coarse tuning, fine tuning, output level.
Batteries: 2 standard 9 volt cells (included).
Size: 4¾" x 3¾" x 2¼".
Weight: 20 oz.
Suggested List Price: $225.00

ADC PRODUCTS
XLR-TYPE AUDIO CONNECTORS
4900 West 78th st., Minneapolis, Minnesota 55435
Los Angeles, CA
(213) 594-6160
Contact: Gary Greening, Sales Engineer.
Date Product Introduced: July 1978.
Product Description: ADC has introduced a variety of professional low impedance three pin audio connectors. The complete line includes both male and female plug connectors, round and rectangular receptacles. ADC connectors are compatible with the other XLR-Type connectors currently being used.
Recommended Usages: Applications requiring three pin/contact low impedance connectors, i.e. microphones, mixing consoles, recording consoles, audio snakes, microphone cables, power amplifiers and speakers.
Specifications: Three pin XLR-Type Audio Connectors have zinc die cast shells with nickel finish and are available with silver or gold plated pins/contacts. The audio plug connectors are available with either standard or small strain relief grommets. The black insert material is crack resistant glass filled nylon. Contact current rating is 15 amps/130 volts.

AMANITA SOUND, INC.
PERFORMERS SPEAKER SYSTEM (9090 PA)
40 Maine Ave., Easthampton, MA 01027
(413) 527-6910;
Contact: Edward L. Alford, President.
Date Product Introduced: July 1978.
Product Description: Amanita Performer's Speaker System is designed to be a totally functional speaker system providing efficient wide range response, protective portability with ease of handling at surprising low cost. The model 9090 is a two-way wide range system consisting of two 12" speakers and one 2 x 6 aceramic horn in each equal-sized half.
Recommended Usages: This frequently used configuration coupled with ASI's patented acoustical designs transcends the previous limitations of rigid-walled enclosures by eliminating peaks and valleys caused when using acoustically sensitive equipment (mics, stringed instruments etc). This peak & valley interaction is a different form of feedback which is often detected on a guitar by hot spots and dead spots on the neck and is noticed by vocalists as a tubby sound or sometimes as a sudden drop out in the vocal range. The Amanita solution to this natural phenomenon is having the enclosure breathe with each note. This is a controlled vibration determined by frequency, amplitude and wall compliance. For small concert and night-club use, also excellent for keyboard or acoustic guitar use.
Specifications: Enclosure Design: Variable passive radiation.
Frequency Response: 65 - 20,000 Hz.
Crossover: 2-way electro-mechanical A 2500 Hz.
Power Handling: 130 watts continuous sine wave.
Nominal impedance: 16 ohms.
Dimensions: 33"H x 21"W x 22"D (closed pair).
Net Weight: 87 lbs. (closed pair).
Suggested List Price: $375.00

ASI
ASI HEADPHONE OUTPUT BOXES
P.O. Box 6520, San Antonio, Texas 78209
(512) 824-8781
Contact: Galen Carol, President.
Date Product Introduced: August 1978.
Product Description: The ASI Headphone Output Boxes were designed as an accessory item to augment the ASI Microphone Input Panel line. The boxes are available in 4 or 8 output sizes with or without individual level controls. All boxes utilize cast aluminum construction and feature Switchcraft connectors.
Recommended Usages: Recording studio, sound reinforcement, TV, broadcast, educational institution.

ASI
ASI MICROPHONE INPUT PANEL
P.O. Box 6520, San Antonio, Texas 78209
(512) 824-8781
Contact: Galen Carol, President.
Date Product Introduced: August 1978.
Product Description: High grade aluminum stock, that has been brushed and anodized, is used for construction. The numerals are then engraved (not painted) into the panel for a beautiful and functional appearance. The panels are available in 8, 16 and 24 input configurations, and each comes equipped with headphone output jacks. High quality Switchcraft cannon connectors with matte finish and gold plated contacts are used throughout. All panels are manufactured on a computer controlled punch for close tolerances.
Recommended Usages: The ASI Microphone Input Panels are designed primarily for recording studio and sound reinforcement usage as well as television and radio broadcast facilities.
Suggested List Price: 8 input: $119.00; 16 input: $149.00; 24 input: $179.00

ASI
ASI PSU-20/20v
P.O. Box 6520, San Antonio, Texas 78209
(512) 824-8781
Contact: Galen Carol, President.
Date Product Introduced: June 1978.
Product Description: The ASI PSU-20/20v is a dual 20 volt power supply adaptable to a number of applications. Primarily designed for use with the Marshall Time Modulator, the unit can be used for any application requiring a high quality, protected and regulated power supply. The unit comes mounted on a 5" x 19" black anodized aluminum panel intended for rack mounting.
Recommended Usages: Powering up to four Marshall Time Modulators.
Suggested list price: $149.00

ASI
ASI PSU-48V PHANTOM POWER SUPPLY
P.O. Box 6520, San Antonio, Texas 78209
(512) 824-8781
Contact: Galen Carol, President.
Date Product Introduced: July 1978.
Product Description: The ASI PSU-48v is 48 volt power supply intended for phantom powering condenser microphones. The unit is a completely regulated and protected power supply capable of powering 24 or more condenser microphones. The power supply is mounted on a 5" standard 19" wide rack plate that has been anodised black.
Recommended Usages: Powering condenser microphones.
Suggested List Price: $119.00

ATLAS SOUND
MICROPHONE DESK STAND — MODEL DS-2
10 Pomeroy Rd., Parsippany, N.J. 07054
(201) 887-7800
Contact: Howard Berke, Sales Manager.
Date Product Introduced: October 1978.
Product Description: Designer-styled vibration-isolating desk stand with dependable stability to support any modern microphone. The low silhouette stand features an integral, tension-variable vibration-resisting element and is recommended for use whenever it is desirable to reduce the conductivity of external

mechanical vibrations into the microphone.
Recommended Usages: Designed for application with all recording activities or sound reinforcement systems and in conference centers, meeting rooms, pulpit and rostrum, or in broadcast facilities. Modern styling, and non-reflective textured finish of the base, make it specially suited for use under high intensity lights on stage or in television studios.
Specifications: Stand Dimensions: Length 5¾", Width 4¾" Height 4½".
Thread size: 5/8" — 27 for all standard microphone holders.
Material: Base — cast metal; Tube — chrome plated steel.
Finish: Textured black.
Weight: 2 lbs.
Suggested List Price: $17.10

AUDICON, INC.
CABLE
1200 Beechwod Avenue, Nashville, TN 37212
(615) 256-6900
Contact: Graeme Goodall, Sales Manager.
Date Product Introduced: January 1979.
Product Description: Specially designed multi pair, individually shielded and jacketed (each pair) available in 32, 24, 8, and 4 pair configurations.
Recommended Usages: All audio system applications.
Specifcations and Price: Upon request.

AUDIO ENGINEERING ASSOCIATES
FIBER CARRYING CASE FOR REVOX A—77 AND B-77 RECORDERS
No. 85 Arroyo Annex, Pasadena, CA 91109
(213) 798-9127
Contact: Wes Dooley.
Date Product Introduced: April 1979.
Product Description: Foam-lined fiber carrying case for ReVox Model A-77 and B-77 recorders protects these machines when being transported. Includes space for take-up reels, power cords, and connection cables.
Suggested List Price: $65.00

AUDIO ENGINEERING ASSOCIATES
TRANSPORT 'HALF-CASES' FOR REVOX A-700 AND STUDER B-67 RECORDERS
No. 85 Arroyo Annex, Pasadena, CA 91109
(213) 798-9127
Contact: Wes Dooley.
Date Product Introduced: April 1979.
Product Description: Sturdy transport covers for the ReVox A-700 and the Studer B-67 tape recorders are made from ATA-type material, and are available in a variety of colors. These covers protect the front and sides of these machines when being carried from one location to another, in car or truck. (These are not full ATA Flight Cases, however).
Recommended Usages: General transportation of these recorders.
Suggested List Price: $185.00 each.

AUDIO ENGINEERING ASSOCIATES
TWELVE AND FIFTEEN FOOT COLLAPSIBLE ALUMINUM MIC STANDS.
No. 85 Arroyo Annex, Pasadena, CA 90019
(213) 798-9127
Contact: Wes Dooley.
Date Product Introduced: April 1979.
Product Description: Lightweight and easily portable, these twelve and fifteen foot stands are a 'must' for location recording. Strong enough for even the heaviest mics, yet light enough to carry easily in your equipment cases. Large tripod base gives good stability.
Recommended Usages: Location recording, where maximum height is desired, without the complication of hanging or rigging mics from the ceiling.
Suggested List Price: 12 ft. $65.00; 15 ft. $85.00

AUDIO TECHNOLOGY
MODEL 440 PHONO PRE-AMPLIFIER
1169 Tower Rd., Schaumburg, IL 60195
(312) 885-0066
Contact: Bill Griffis, Sales Manager.
Date Product Introduced: January 1979.
Product Description: The 440 is a completely self-contained state-of-the-art phono preamplifier with inputs for moving magnet and moving coil type cartridges. Resistive and capacitive load for the moving magnet input is programmed by the use of individual switches on the rear panel. Similar switches are provided for resistive programming on the moving coil input. Overall gain, as well as input selection is accomplished through the use of a single 5 position control. A 33 position constant impedance attenuator at the output provides precise 2dB increments for control of volume.
Recommended Usages: The Model 440 will find application in cutting channels as a master preamp for monitoring playback when checking a lacquer, transferring records to tape, the direct

X.cessories & Other Equipment

airing of records, or any other situation requiring high accuracy playback from recorded disc's.
Specifications: Frequency Response: 20 Hz - 20 KHz, ± 0.25dB for RIAA input characteristics.
Signal to Noise Ratio: Moving magnet — 88dB ref 10mV, moving coil — 80dB ref 1mV.
RIAA Accuracy: ± 0.25 dB.
THD and IM Distortion: Less than 0.01%.
Input Impedance: Moving magnet-100K or 47K, combination of 20, 50, 100, 200 pf. Moving Coil: combinations of 20, 50, 100, 200, 500 ohms.
Gain: 40dB to 80dB in 10dB steps (5 steps).
Output Level: + 20dBm (7.75 v RMS) ref to 1mV in. 2dB steps — Standard reference levels pf + 4dBm and 16dBm may readily be selected.
Output Impedance: 600 ohms.
Projected Delivery: May 1979.
Suggested List Price: $189.95. Moving coil option $49.95. Oak end panels $7.95. Rack panel $11.95.

AUDIO TECHNOLOGY
MODEL 510B PEAK RESPONDING LED DISPLAY
1169 Tower Rd., Schaumburg, IL 60195
(312) 885-0066
Contact: Bill Griffis, Sales Mgr.
Date Product Introduced: January 1979.
Product Description: The Audio Technology Model 510B Multi-Color Display is a peak-responding level indicator capable of reading voltage levels (preamp or tuner outputs for example) and power levels. It is thus useful in tape recording as well as monitoring power amplifier output. The 510B features green LED's from − 39 to − 1, yellow at 0, and red from + 1 to + 6. The 0 dB levels can be adjusted for both line and power level indication with rear panel controls. Sensitivity of the line level inputs is continuously adjustable and for power level inputs it is switchable for 0-dB points of 25, 50, & 100 watts into load impedances of 4, 8, or 16 ohms. Switching from the line level (dBm) to the power level (dBw) mode is accomplished with a front panel pushbutton. In the dBw mode, the instrument is RMS calibrated.
Recommended Usages: The Model 510B will find applications in broadcast production consoles, studio mixing consoles, final level monitoring before the cutting lathe, or wherever an accurated indication of true peak audio signal level is desired. The 510B is especially suited to monitoring the signal level to a tape machine as tape is easily saturated by peak signals. The 510B allows the user to optimize recorder performance in terms of full use of available headroom, best signal-to-noise ratio and avoidance of distortion associated with tape saturation.
Specifications: The 510B has a frequency response of 20 to 20,000 Hz input impedances of 100,000 ohms for the line level inputs and 20,000 ohms for the power level inputs.
The 0-dB level for the line inputs is adjustable from 50mV to 5V.
The power inputs can display levels from 0.003 to 400 watts.
In any one sensitivity setting the display range is 45 dB (− 39 to + 6 dB).
The display resolution near the 0-dB point is 1 dB.
The 510B measures 7½" x 1¾" x 5½".
Suggested List Price: $149.95. Genuine oak side panels are available for $7.95 as well as 19 x 1¾ inch rack-mount front panel for $11.95.

AUDIOTOOLS, CORP.
AT-4
5250 N. Broadway, Denvar, CO 80216
(303) 534-5683
Contact: David Hadler, Vice President.
Date Product Introduced: November 1978.
Product Description: A 3-way mid-bass, mid-high frequency transducer to be used in connection with floor mounted sub-woofer system thus avoiding large unsightly hanging black boxes typical of many disco installations. The speaker has extremely high efficiency and still capable of sustained output levels. Critically engineered for the installer who requires low maintenance as a sales tool.
Recommended Usages: Discotheques and critical mix monitors for Disco Recording.
Specifications: Available in a variety of veneers. Write for specs.
Suggested List Price: $750.00

B & B AUDIO (MARKETED BY APHEX SYSTEMS, LTD.)
B & B VCA 500A.
7801 Melrose Ave., Los Angeles, CA 90046
(213) 655-1411
Contact: Jon J. Sanserino, Director OEM Prods.
Date Product Introduced: November 1979.
Product Description: A plug-in retrofit module for the MCI Series 500 VCA card. Greatly improves all operating parameters in the series 500 consoles. Reduces noise and distortion significantly, and results in a dramatic improvement in sonic quality.
Recommended Usages: All automation equipped MCI series 500 mixing consoles and other series that use the same VCA card.
Specifications: THD: .004% (typ.)
IMD: .018% (typ.)
Modulation Noise: 8 dB.
Max. Attenuation: 95 dB (20 Hz to 20 KHz).
Bandwidth: 1 Hz to 250 KHz, − 3 dB.
Suggested List Price: $100.00

CERWIN-VEGA
CERWIN-VEGA CX-2 PROFESSIONAL CROSSOVER
12250 Montaque St., Arleta, CA 91331
(213) 896-0777
Contact: Michael Koehn, Public Relations.
Date Product Introduced: January 1979.
Product Description: The CX-2 is a professional passive electronic crossover with fixed 12 dB/octave slopes. Available in 100 Hz, 150 Hz, and 250 Hz versions. These pocket-size units require no power supply, are noiseless, distortionless, and present no insertion loss to high impedance lines (◄1 dB).
Recommended Usages: Ideal component to bi-amplify PA, commercial sound, or home systems, without the expense of an active electronic crossover.
Specifications: Crossover Frequencies: Available in 100 Hz, 150 hz, and 250 Hz models.
Slope rate: 12 dB/octave.
Distortion at or below 2.5v (+ 10 dBm) out: virtually unmeasurable.
Output Noise: unmeasurable (equal to input noise).
Insertion Loss: 1 dB max; typically 0.25 dB.
Nominal Input Impedance: 313K ohms (varies with output load).
Recommended Output: 5K ohms or greater.
(Load) Impedance Crosstalk Channel to Channel (IHF): − 70 dB at 20 KHz; typically greater than − 85 dB.
Max. recommended input voltage: 11V (+ 21 dBv).
Connections: Standard RCA phono (pin) jacks.
Dimensions: 7 x 2¾ x 1¼ inches; 178 x 70 x 32 mm.
Weight: 14.5 oz.; 415g.
Suggested List Price: $100.00

CLEAR-COM INTERCOM SYSTEMS
RS-202S 4-CHANNEL REMOTE STATION
759 Harrison St., San Francisco, CA 94107
(415) 989-1130
Contact: Edward Fitzgerald, Nt'l Sales Manager.
Date Product Introduced: April 1979.
Product Description: The RS-202 4-Channel Remote System consists of two discrete intercom channels and two ilsten only program channels that are mixed together in the remote station and fed to binaural phones. Two separate mic on/off switches allow you any combination of talk/listen capabilities. The two program signals come in at line level. Channel A is transformer isolated and balanced. Channel B is unbalanced. A total of three 2-conductor shielded mic cables are required to bring all four lines into the RS-202. For single channel operation only one mic cable is needed. The side tone is adjustable on both channels.

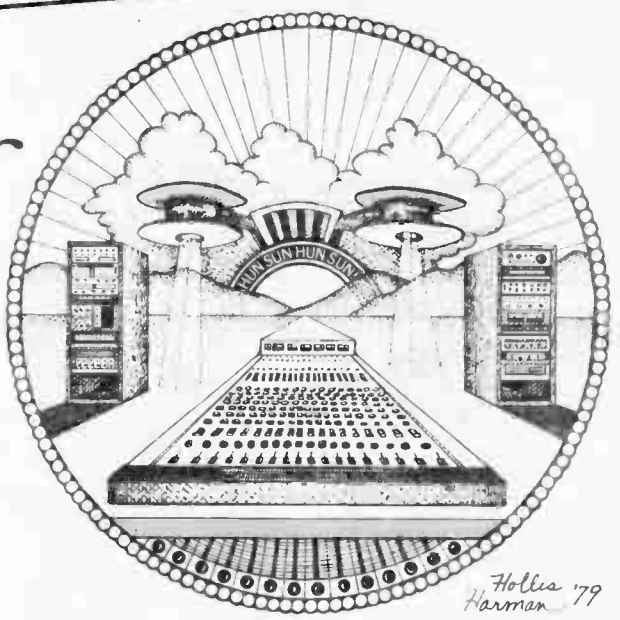
COUNTRYMAN ASSOCIATES
TYPE 85 FET DIRECT BOX.
424 Stanford Ave., Redwood City, CA 94063
(415) 364-9988
Date Product Introduced: August 1978.
Product Description: The type 85 is an active direct box employing a low noise FET amplifier to reduce loading effects by 200 times and distortion by 10 times when compared with a direct box of conventional design. It is housed in a single piece extruded box that will withstand over a ton of crushing force. Power is provided from a standard 9V battery or from 48V Phantom power through a built in DC to DC converter taht preserves complete ground isolation.
Recommended Usages: The Type 85 is ideally suited for interconnecting a guitar pickup or other high impedance transducer with a low impedance, balanced microphone input. Bass guitarists will especially appreciate the Type 85's extended low frequency response and complete freedon from loading effects. The wide frequency response, low distortion, and low noise of the Type 85 will enable it's use in applications where ordinary direct boxes are unacceptable.
Specifications: Input Impedance: 10 Meg Ohms.
Frequency Response: 20 Hz to 20KHz ± .5 dB.
Noise referred to Input: 1uV Max. 50 Hz to 15 KHz.

PROFESSIONAL AUDIO
SALES\ERVICE ENTAL
REHEARSAL TUDIOS

HUN SOUND

647 IRWIN ST.
SAN RAFAEL CA. 94901
415·454·2911 OFFICE·STUDIO
415·924·2600 24HR ANS. SER.

Introducing our new 16 track recording Studio



Take a look at what is available for your professional needs

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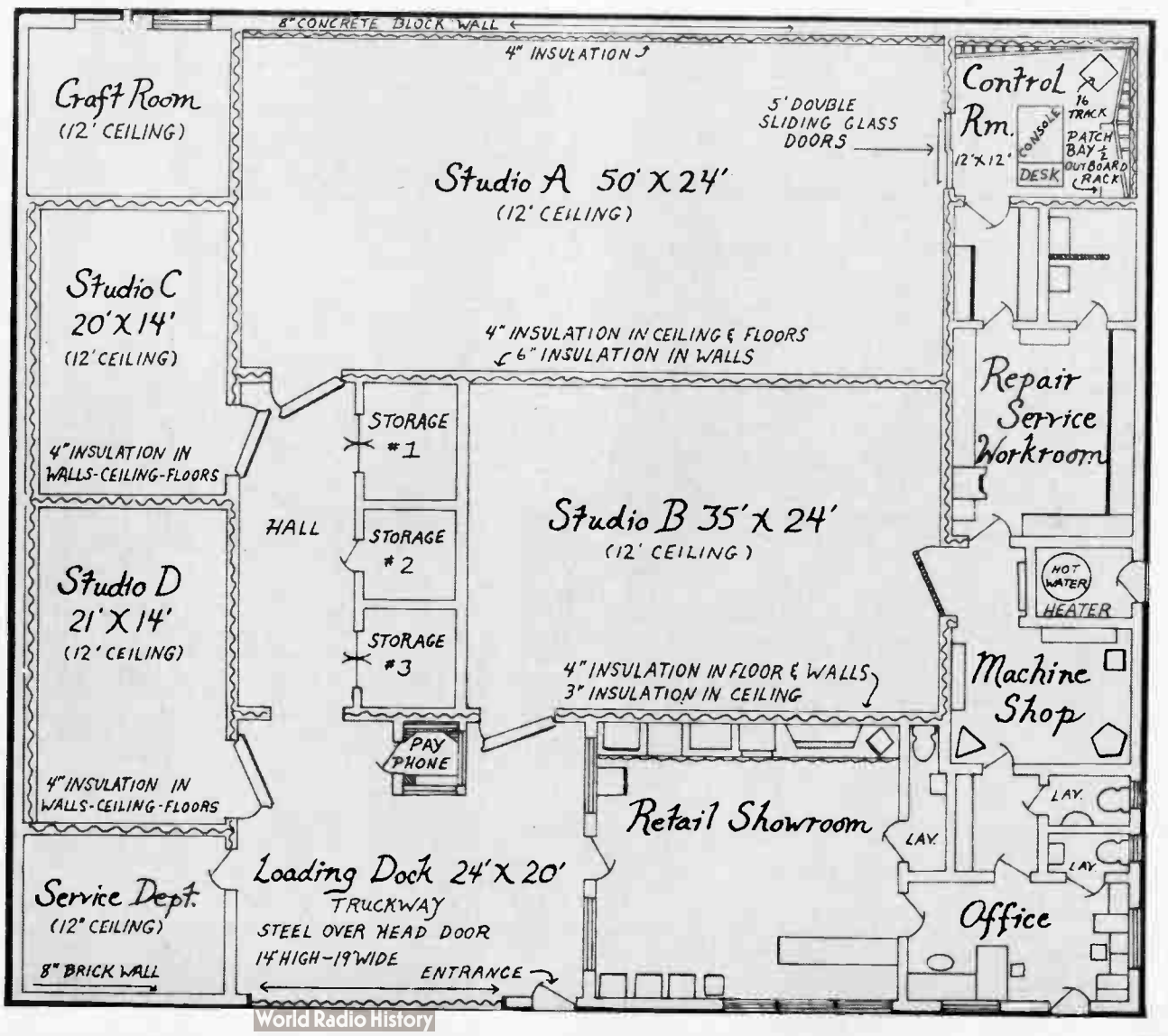
- Crown
- Electro Voice
- Linear Audio Systems
- PML Mics
- Road Runner Cases
- Anvil Cases
- Marantz
- White Instruments
- Speck Electronics
- Superscope
- Hard Truckers
- Sweet "C" Amplifier's
- Allen and Heath
- H and H Amplifier's

HUN



Total Harmonic Distortion: .05% at 1 KHz and 1V PP on input.
Power Requirements: 48V phantom power or 9V battery.
Dimensions: 1¾" x 3" x 5".

Countryman Associates
Type 85 FET Direct Box

Countryman Associates
Ultracom System 200 Intercom

COUNTRYMAN ASSOCIATES
ULTRACOM SYSTEM 200 INTERCOM
424 Stanford Ave., Redwood City, CA 94063
(415) 364-9988
Date Product Introduced: January 1979.
Product Description: Ultracom System 200 is a true two channel stage and production intercom system that uses standard microphone cable and connectors. In addition to the usual assortment of power supplies, belt packs, and speaker stations, Ultracom provides features not available on other systems. Each station employs AGC on it's microphone input to prevent blasting. Multiplex capability allows up to 4 broadcast quality program audio channels. The selective cue system can provide individual signaling of each station. Ultracom can also provide hands free wireless stations for users who require maximum mobility.
Recommended Usages: System 200 provides high fidelity, low fatique communication for television, motion picture, lighting, sound reinforcement, construction, or any other activity that requires coordinated action at different locations. In musical production the ability to receive multi channel program audio at each station encourages crew members to wear headsets and contributes to a tight performance. Fast moving operations like action news will find Ultracom's wireless capability indispensable.
Specifications: Communications Channels: Two available at each station, including Belt Packs.
Program Channels: Optional, Up to two for each Com. Channel.
Frequency Response: ± 3 dB 50 Hz to 15 KHz Program and Com.
Signal to Noise Ratio: 65 dB Program and Com.
Headset Capability: Can use any headset.
Power Requirements: Power supplies are available for 80 to 240V AC, and 12V or 24 to 50V DC operation.

CUSTOM AUDIO ELECTRONICS
LITTLITE
2828 Stommel Rd., Ypsilanti, MI 48197
(313) 482-6568
Contact: Glenn Quackenbush
Date Product Introduced: May 1979.
Product Description: A line of gooseneck lamps for illumination of control panels and work spaces in dimly lit areas. Various mounting brackets, power supplies and dimmer controls are

X.cessories & Other Equipment

available to facilitate the addition of these devices to new and existing equipment.
Recommended Usages: Applications include pro audio lighting and industrial equipment, musical instruments, high fidelity and disco gear.
Specifications: Littlite I — Complete kit with detachable 12 volt lamp, 360° swivel base, dimmer, power supply, cable and mounting hardware.
Littlite II — Complete kit with 12 volt lamp, base, hi-lo-off switch, power supply, cable and mounting hardware.
6G: 6" flexible lamp with connector.
12G: 12" flexible lamp with connector.
18G: 18" flexible lamp with connector.
Other accessories are also available. Write for free catalogue.

Custom Audio Electronics
"Littlite"

db SYSTEMS LTD.
THE FICS® — FLAT INTERFACE CABLE SYSTEM®
R.D. #4, Flemington, NJ 08822
(201) 782-4791
Contact: Dan R. Balde, Sales Director.
Date Product Introduced: March 1979.
Product Description: The FICS® is a three-piece system for connecting stage microphones and amplifiers to mixing boards. It utilizes low profile flat cable, provided on a custom reel, with detachable stage box and harness assemblies designed for quick set up and break down. The cable is designed to give equivalent electrical performance to the conventional jacketed bundle low impedance balanced line multi-cables. The whole system is easily transported in an optional compact attache-sized road case.
Recommended Usages: The system is designed for short-term sound system installations for traveling companies. With its low profile, it is not susceptible to traffic damage and does not present a tripping hazard. The cable can be secured and covered by a special broad vinyl type supplied for this purpose by db Systems Ltd.
Specifications: Specs: 24 channels — 20 input and 4 returns.
Input and return connectors: style 297-A (XLR) Switchcraft.
Multiconductor connectors: Micro-Ribbon style, 50 position, A-M-P Champ (field serviceable).
Cable: constructed of 25 pairs of 26 gauge wires with inter-pair and overall shielding provided by conductive polymer & covered by an outer jacket of tough mylar.
Dimensions: 2½" wide by .040" thick.
Standard Length: 125 ft. mounted on a 12" reel w/stand.
Standard Stage Box: 16 gauge steel case w/aluminum panel 13½ x 7¼ x 3½ inches.
Mixer harness Assembly: 6 ft. total length w/2 ft. "tails".
Options: Foam fitted road case 21 x 17 x 6½ inches.
19" rack mount style stage box.
250 ft. length on a 14" reel w/stand.
Field servicing & connectorizing kits.
5" wide black vinyl tape .010" thick(100 ft. rolls).
5 ft. mixer adaptor cables, micro-ribbon connector style to your style.
Suggested List Price: $600.00 - $1,000.00 depending upon options chosen.

DOLBY LABORATORIES, INC.
CAT. 155
731 Sansome St., San Francisco, CA 94111
(415) 392-0300
Date Product Introduced: To be available by third quarter of 1979
Product Description: Cat. No. 155 has been designed specifically to incorporate two independent channels of traditional Dolby® A-type noise reduction within the Sony BVH-1000 videotape recorder. It provides 10dB of noise reduction, from 20Hz upwards, rising to 15dB at 9 KHz and above.
Recommended Usages: It plugs into an existing unused circuit card location in the Sony BVH-1000, with minor changes to the back plane; a bypass switch allows for instant removal of the noise reduction card, restoring the videotape recorder to its unmodified state.
Suggested List Price: Will be under $1000.00

DOLBY LABORATORIES, INC.
NRU-10
731 Sansome St., San Francisco, CA 94111
Contact: Robert A. Peterson, Director of Technical Support
Date Product Introduced: April 1979, available 4th quarter 1979.
Product Description: Two channel Dolby A-type noise reduction unit with record and playback level controls and VU meters.
Recommended Usages: Designed to connect to recorders (such as most VTRs) whose built-in audio gain controls and meters are regularly used for level setting.
Specifications: Amount of noise reduction from 20 Hz to 9 KHz is 10 dB rising to 15 dB above 9 KHz.
Suggested List Price: Under $3,000.00

DYMA ENGINEERING INC.
MODEL 815
P.O. Box 1697, Taos, N.M. 87571
(505) 758-8686
Contact: Michael Zjomjco
Date Product Introduced: January 1979.
Product Description: High output audio distribution amplifier. Plus 26 dBm into 600 ohm load, 10 outputs, state-of-the-art LSI design. Each amplifier contains its own power supply for easy maintainability. 10 amps per rack frame. Easiest installation... no wires to lug, no connectors to install. Performance also state-of-the-art.
Specifications and Suggested List Price: Premier technical specs at $259.00 per module. Rack frame $159.00

Edcor
AP-10 Headphone Amp

EDCOR
AP-10 HEADPHONE AMP
16782 Hale Avenue, Irvine, CA 92714
(714) 556-2740, (800) 854-0259
Contact: Wayne Wyche, Marketing Manager
Date Product Introduced: April 1, 1979.
Product Description: Edcors AP-10 Headphone Amplifier is designed to distribute one program source to four headphones. The AP-10 will accept either mono or stereo input, and has an overall switchable stereo/mono output. With individual gain controls and a master, the AP-10 incorporates 4 separate 4-watt low noise amps. Separate low and high impedance inputs are provided.
Recommended Usages: Not enough headphones to go around? Whether you are a studio engineer or a high fidelity enthusiast, the AP-10 is designed to render true fidelity.

X.cessories & Other Equipment

Specifications: Frequency response is 20-22kHz ± 1.0dB for no loss of fidelity.
No lightweight in performance, the AP-10 weighs only 2.5 lbs.
And Measures 2½ x 6 x 9 inches.
Suggested List Price: $200.00

EECO
MTG-100 SERIES SYNCHRONIZER
1601 East Chestnut Ave., Santa Ana, CA 92701
(714) 835-6000
Contact: George Swetland, Product Manager.
Date Product Introduced: August 1978.
Product Description: EECO's MQS-100 series sychronizing system can cue and synchronize any three mag tape transports including video, audio and mag film simultaneously. The SMPTE/EBU edit code used for indexing of tapes need not be identical and tapes with drip frame and non-drop frame formats can be inter-mixed. System modes include high speed search and cue, follow the leader or "chase mode" synchronized play back, fast and slow re-synchronization and roll back with automatic re-synchronization.
Recommended Usages: The MQS-100 can control and synchronize video and audio recorders for matching audio to video for perfect lip sync and the timing of special effects to match video action. Simulcast transmissions of FM stereo and the experimentation with new sight and sound relationships for exact pre-edit cue point selections are easily accomplished. Multiple video recorder can be controlled and synchronized for simultaneous program presentation, program sequence selection, off line edit, network program backup and on line program editing.
Specifications: Size: 7" x 19" x 21" deep, weight 25 lbs.
Power 104 - 125 VAC/210-250 BAC, 50 - 60 VAC, 200 watts.
Fuse, 3 amp, 115 VAC or 1.5 amp.
235 VAC interface box, one pre recorder, relay output 2 separate forms.
120 MS duration for machines scheduled to time events number 1 and 2.
Code output restored code from each recorder during play for re-distribution to other recorders.
Reference input house composite video/composite sync.
Output ot machines, stop, play, fast forward, RW, Lifter defeat.
Input for machines — machine status, stop play, wind motion and edit code.
Suggested List Price: 12K - 15K depending upon option selected.

EECO
MTG-550 SERIES MASTER TIME CODE GENERATOR
1601 East Chestnut Ave., Santa Ana, CA 92701
(714) 835-6000
Contact: George Swetland, Product Manager.
Date Product Introduced: August 1978.
Product Description: EECO's MTG-550 series master time code generator generates standard SMPTE/EBU Edit Code formats used for electronic indexing of video and audio tape. Incorportated is EECO's unique LSI time code generator chip (EECO 5200) which contains all the basic logic necessary for presetting and display time; inserting user bit; licking to video or other reference sources; internal selection of 25 or 30 frames per second frame rate; and selection of drop or non-drop frame code.
Recommended Usages: The edit code when recorded on magnetic tape, precisely identifies the tape by hour, minute, second, and frame. The time code can be synchronized to either line power frequency, composite, video or composite sync. LED display shows the generated time of day or elapsed time from 0 to 24 hours. Display time is available at an output connector as parallel binary coded decimal signals. The signals can be used to drive auxillary time displays, or invent devices.
Specifications: Power requirements: 117 or 234 VAC ±10%, 47-62 Hz, ten watts.
Inputs: video/sync: signals may be either composite sync (MTSC only) or composite video (MTSC, PAL, and CECAM).
Amplitude: 1.0 volts, peak to peak plus or minus, 6 dB (comp, sync).
Impedance: 15K minimum.
Operating temperature 0 degrees C to + 50 degrees C.
Non-operating temperature: – 20 degrees C to + 85 degrees C.
Mechanical: height 1¾", width 19" standard rack mount, depth 14", weight 10 lbs.
Suggested List Price: $2,850.

ELECTRO-HARMONIX, INC.
MINI-MIXER
27 West 23rd St., New York, NY 10010
(212) 741-1770
Contact: Larry DeMarco, Customer Relations Mgr.
Date Product Introduced: September 1978.
Product Description: 4 in, 1 out active mixer in a very compact package (8" x 6¾" x 1½"). High impedance, unbalanced inputs. Input Gain and Master Volume sliders. Power switch and LED indicator. AC power, regulated.
Recommended Usages: Suitable for use with high impedance microphones, guitar pick-ups, electronic instruments, accessory outputs, and amplifier line outputs.
Specifications: Input Impedance: 100 Kohms.
Output Impedance: 100 ohms.
Input Gain (Max., each channel): 15 dB.
3 lbs.
Suggested List Price: $69.95

THE ENERGY GROUP
ENERGY
13300 S.E. 30th, Bellevue, WA 98005
(206) 746-7200
Contact: Juliana Roberts, Communications Director.
Date Product Introduced: Current.
Product Description: Custom console woodworking. Utilizing any hardwood, i.e. walnut, oak, birch.
Recommended Usages: Any application where custom woodworking is requlred. Consoles for accessories, or custom racks, etc.
Suggested List Price: Price bid per job or project.

THE ENERGY GROUP
ENERGY L115 & ENERGY L215
13300 S.E. 30th, Bellevue, WA 98005
(206) 746-7200
Contact: Juliana Roberts, Communications Director.
Date Product Introduced: January 1979.
Product Description: Low frequency bass horns. L115: Single 15" long throw bass cabinet, exponential horn good to 40 Hz.
L215: Double 15" long throw bass cabinet, exponential horn good to 40 Hz.
Recommended Usages: Any concert or sound reinforcement application where long throw is needed and low frequency response is required.
Specifications: Freq resp: L115- 40 - 1 KHz. L215- 40 - 1 KHz.
V. Dispersion: L115- 35; L215- 45.
H. Dispersion: L115- 90; L215- 80.
Cabinet: 9 ply birch.
Horn length: L115- 21.5"; L215- 19.5".
Suggested List Price: L115 $250.00; L215 $384.00

EVENTIDE CLOCKWORKS INC.
MONSTERMAT
265 West 54th St., New York, NY 10019
(212) 581-9290
Contact: Heather Wood, Marketing Mgr.
Date Product Introduced: March 1979.
Product Description: Mono-stereo matrix unit with dbx noise reduction.
Recommended Usages: For broadcast use when AM stereo happens. Commercials are frequently made on mono cartridges. The Monstermat prevents phase cancellations which result in muddy, lifeless mono sound.
Specifications: 19" rack mount, 1¼" high.
Available as record/play or play/play.
Suggested List Price: $995.00

EVENTIDE CLOCKWORKS INC.
REAL TIME ANALYZER
265 West 54th St., New York, NY 10019
Contact: Heather Wood, Marketing Mgr.
Date Product Introduced: April 1979.
Product Description: A circuit board which fits inside the Commodore "Pet" home computer, utilizing Pet power supply. No modification of Pet required. Complete real time analyzer, third octave.
Recommended Usages: Checking frequency response of rooms to optimise equalization.
Specifications: Covers spectrum 20Hz to 20KHz in third-octave bands. Displays on Pet CRT screen.
Suggested List Price: $595.00 needs Pet Computer (Commodore Business Machines) with 8K memory. Cost of Pet $795.00

GOTHAM AUDIO CORP. (N. AMERICAN DISTRIBUTORS)
NEUMANN VMS80 AUTOMATED DISK MASTERING LATHE
741 Washington St., New York, NY 10014
(212) 741-7411
Contact: Eli Passin, Vice President.
Date Product Introduced: November 1978.
Product Description: The VMS80 introduces the following innovations: crystal controlled DC Servo turntable drive; Servo controlled pitch drive; optimized pitch control system insuring highest playing time for all types of program material; auto function control system stores all lathe commands in logical sequence; master crystal clock syncs all speed/time dependent functions; new bearing reduces vertical rumble to insignificance; air cushion supports isolate the lathe from external shock or vibration; microscope is video monitored.
Recommended Usages: The Neumann VMS80 is recommended for use in cutting systems where the highest quality stereo mastering is required.
Specifications: Specifications on application.
Suggested List Price: Approximately: $86,000.00

LEADER INSTRUMENTS CORPORATION
LFM-39A WOW FLUTTER AND DRIFT METER
151 Dupont St., Plainview, NY 11803
(516) 822-9300
Contact: George W. Zachmann, Marketing Manager.
Date Product Introduced: February 1979.
Product Description: The LFM-39A provides for measuring wow and flutter, either separately or combined, from 0.005% to 3%. Drift measurements are made from – 5 to + 5% with + 0.25% accuracy. Measurements can be made at either 3.0 or 3.15kHz and to either JIS, CGIR or DIN standards.
Recommended Usages: Used to measure the performance of tape decks, transports, etc.
Specifications: Input Frequency: 3kHz or 3.15kHz.
Input Voltage: 15mV to 10Vrms.
Drift Measurements: 0 to ± 5% referred to 3.0 or 3.15kHz ± 0.25%.
Wow and Flutter Measurements: 0 to 0.03, 0.1, 0.3, 1 and 3% full scale.
Reference Oscillator: 3.0 and 3.15kHz ± 0.05%.

MCI, INC.
AUTOLOCK
4007 N.E. 6th Ave., Fort Lauderdale, Florida 33334
(305) 566-2853
Contact: MCI, Inc. Marketing Dept. or local authorized MCI dealer
Date Product Introduced: November 1978.
Product Description: A SMPTE/EBU Generator/Reader/Synchronizer.
Recommended Usages: To interface two (2) MCI transports together and the capabilities of interfacing VTRs with ATRs.
Specifications: AMPTE/EBU Reader/Generator/Synchronizer
Offset range only limited by length of tape
NTSC color code capable
Accepts neopilotone (50 Hz, 60 KHz)
LED indication for slave status with respect to the master (advanced or retarded), plus many other capabilities.
Suggested List Price: Low-cost single unit: $7,050.00

MICROTRAN COMPANY, INC.
BROADCAST FIDELITY LINE MATCHING TRANSFORMER, MT36-PC
145 E. Mineola Ave., P.O. Box 236, Valley Stream, NY 11582
(516) 561-6050
Contact: Albert J. Eisenberg, Marketing Mgr.
Date Product Introduced: January 1979.
Product Description: Compact Plug-In Studio Grade Audio Line Matching Transformer. Designed for broadcast and recording studio applications. Other constructions available on special order.
Recommended Usages: Provides balanced isolated coupling of program quality telephone/line signals at studio.
Specifications: 50-15 KHz at ± 0.5dB.
0.5% maximum distortion over range.
Power level range up to 15dBm.
Size: 1"D x ⅞"H x 1½"L.
Suggested List Price: $10.00

NEPTUNE ELECTRONICS
ELECTRONIC CROSSOVER
934 N.E. 25th Portland, OR 97232
(503) 232-4445
Contact: Gerry Duffy.
Date Product Introduced: January 1979.
Product Description: Stereo biamp or mono triamp capability, 18 dB/octave slopes. Maximally flat butterworth filters. Single knob frequency controls. High frequency phase reversal switch. Level controls for all outputs. LED peak indicators. Balanced or unbalanced operation. Microphone and phone jack connectors.
Specifications: Frequency Response: 20 Hz - 20 KHz ± .5 dB.
Signal/Noise Ratio: Greater than 90 dB.
Input Impedance: 33K ohms unbalanced (¼" phone jacks). 66K balanced (D3F type).

Output Impedance: 300 ohms unbalanced (¼" phone jacks).
600 ohms balanced (D3M type).
Maximum Input Level: 20 dBV.
Maximum Output Level: 24 dBm unbalanced. 16 dBm balanced.
Gain: Off to 0 dB.
Phase Shift: Less than 5 degrees in pass bands. High frequency switchable to 180 degrees.
Filters: State variable, butterworth, 18 dB/octave.
Crossover Range: X1 100 Hz - 1.6 KHz. X10 1 KHz - 16 KHz.

OPAMP LABS, INC.
MODEL 1010 MATRIX
1033 North Sycamore Ave., Los Angeles, CA 90038
Contact: Bel Losmandy.
Date Product Introduced: August 1978.
Product Description: The 10 x 10 Matrix provides push button assignment of any combination of 10 input audio lines to any combination of 10 output lines. The isolation between input lines is 80 dB and any number of input channels may be assigned to one output channel.
Specifications: Isolation = 80 dB between inputs.
Plug-in solid state amps and transformers.
10 x 10 lighted switch Matrix.
Size 7"H x 19"W x 14"D, relay rack mount.
35 pounds.
Suggested List Price: $2,200.00

PHASE LINEAR CORPORATION
MODEL 1200 SERIES TWO, REAL TIME ANALYZER
20121 48th Avenue West, Lynnwood, WA 98036
(206) 774-3571
Contact: Bruce Lowry, National Sales Manager
Date Product Introduced: 1979 May AES.
Product Description: A complete room equalizing instrument with built-in pink noise source, calibrated microphone and display/filter bank satisfying 'ANSI' standards. Display is accomplished by a 20 Row X 12 Column LED Matrix (240 Leds) size 3½" x 19" x 8".
Recommended Usages: Room Equalization.
Specifications: Frequency Bands: (12) 16 Hz ► 31.5 KHz.
Amplitude Display Range: 20 dB or 40 dB.
Fast/Slow rate switch.
Bar/Dot mode switch.
SPL Calibrated.
Mic or Source Inputs.
Filter Bank: 12 4-pole filters staisfying ANSI S 1.11 - 1966, Class I.

QRK ELECTRONIC PRODUCTS INC.
GALAXY TURNTABLE
1568 N. Sierra Vista Ave., Fresno, CA 93703
Contact: Robert D. Sidwell, President.
Date Product Introduced: February 25, 1979.
Product Description: Turntable with DC motor, electronic speed control, digital direct speed read out.
Recommended Usages: Any sound installation.
Specifications: Variable speed control.
Slip cueing of records.
D.C. motor.
Back cueing with no motor drag.
Instant start.
Direct speed readout on LED.
Solid state circuitry.
Remote start/stop.
Suggested List Price: $545.00

QSC AUDIO PRODUCTS
QSC ELECTRONIC CROSSOVER 1.2
1926 Placentia Ave., Costa Mesa, CA 92627
(714) 645-2540
Contact: Barry Andrews.
Date Product Introduced: January 1979.
Product Description: This product combines our Power Amplifier 4.2 and our Electronic Crossover 2.2 in one chassis to offer the benefits of stereo bi-amping at a substantial savings in cost over separate components, while maintaining flexibility of power selection for the low end. The unit may also be patched to provide the mid and high channels for a mono tri-amp system.
Recommended Usages: Any application requiring stereo bi-amping or mono tri-amping.
Specifications: See the sections listing the QSC Power Amplifier 4.2 and QSC Electronic Crossover 2.2 for specifications.
Suggested List Price: $458.00

X.cessories & Other Equipment

QSC AUDIO PRODUCTS
QSC ELECTRONIC CROSSOVER 2.2
1926 Placentia Ave., Costa Mesa, CA 92627
(714) 645-2540
Contact: Barry Andrews.
Date Product Introduced: January 1979.
Product Description: A stereo 2-way electronic crossover with variable, calibrated crossover controls and level controls on each channel plus hi/low phase switches. The filter circuits are 12dB Bessel high frequency for minimum phase shift with derived low frequency for perfect phase matching. The result is an extremely musical sounding crossover. The unit has balanced and unbalanced inputs and quasi-balanced outputs.
Recommended Usages: Any application requiring stereo bi-amping or mono tri-amping.
Specifications: Crossover frequency range: 250-6kHz.
High and low frequency gain: out to + 10dB.
High/low phase switches: 0, 180 degrees.
Distortion: 0.01%.
Signal to Noise ratio: – 90dB.
Input impedance: 50K balanced, 25K unbalanced.
Output impedance: 300 ohms.
Suggested List Price: $248.00

ROAD ELECTRONICS INC.
PROFESSIONAL COMPONENT PUBLIC ADDRESS SYSTEMS
2101 East 7th St., Los Angeles, CA 90021
(213) 473-6751
Contact: Ed Swanzey, Sales Manager.
Date Product Introduced: January 1979.
Product Description: Road Electronics has introduced a complete line of competitively priced, professional public address systems. All the units — bass enclosures, horn enclosures and high frequency arrays — are compatible and a custom-built system can be assembled from within the Road line to satisfy any user need.
Recommended Usages: A system can be assembled from Road Public Address Components to suit any PA applications.

SAKI MAGNETICS, INC.
LONG LIFE MAGNETIC TAPE HEADS — FERRITE
1649 12th St., Santa Monica, CA 90404
(213) 450-1551
Contact: Trevor J. Boyer
Date Product Introduced: March 1979.
Product Description: Saki Magnetics has developed the first ever, long life ferrite magnetic tape heads for the 24 track 2" M 79 Mincom tape recorder and other professional studio recorders. These heads are constructed of hot pressed TDK ferrite with glass bonded gaps and will outwear standard metal heads by 10 to 15 times, while offering superior high frequency performance.
Recommended Usages: Mincom, Ampex, Studer & MCI equipment.

SENNHEISER ELECTRONIC CORPORATION (NY)
OPEN AIRE HEADPHONE MODEL HD 420.
10 West 37th St., New York, NY 10018
(212) 239-0190
Contact: Cornelis Hofman, Vice President Marketing.
Date Product Introduced: 1979.
Product Description: A new Sennheiser open aire headphone in the tradition of the world famous HD 414, the best sold headphone in the world.
Recommended Usages: Studio use for hours of listening enjoyment without discomfort or fatique.
Specifications: Frequency range: 18 Hz to 20 KHz.
Impedance: 600 ohms per channel.
Weight: 4 oz.
Suggested List Price: $84.80

SENNHEISER ELECTRONIC CORPORATION (NY)
OPEN AIRE HEADPHONE MODEL HD 430
10 West 37th St., New York, NY 10018
(212) 239-0190
Contact: Cornelis Hofman, Vice President Marketing.
Date Product Introduced: 1979.
Product Description: A new top of the line Sennheiser open aire light weight headphone. The dynamic drivers contain magnets made of a new material "cobalt samarium" which allows for magnets of higher strength and lighter weight then ever before. Both, the new HD 420 and HD 430 are made with this material.
Recommended Usages: Studio use for hours of listening enjoyment without discomfort or fatique.
Specifications: Frequency range: 16 Hz to 20 KHz.
Impedance: 600 ohms per channel.
Weight: 7 oz.
Suggested List Price: $119.00

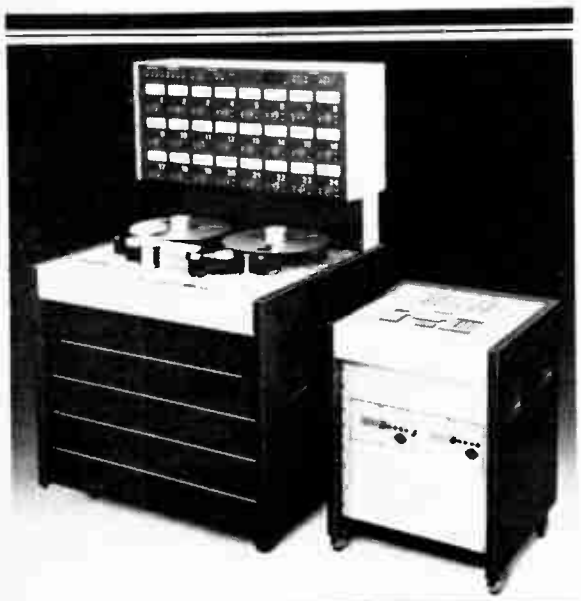
SHURE BROTHERS INCORPORATED
V15 TYPE IV
222 Hartrey Ave., Evanston, Illinois 60204
Contact: Paul Bugielski, Professional Products Manager.
Date Product Introduced: June 1978.
Product Description: The V15 Type IV is a stabilized, static-free, Super-Trackability cartridge-stylus system. The advantages of the Super Track IV system are: dynamically stabilized tracking overcomes record-warp caused problems, such as fluctuating tracking force, varying tracking angle and wow; electrostatic neutralization of the record surface minimizes three separate problems: static discharge, electrostatic attraction of the cartridge to the record, and attraction of dust to the record. An effective dust and lint removal system. A hyper-elliptical stylus tip configuration dramatically reduces both harmonic and intermodulation distortion. Ultra-flat response — individually tested to meet all specifications.
Recommended Usages: The Shure V15 Type IV Stereo Dynetic Phonograph Cartridge is designed for critical playback of phonograph records. It is at home in mastering labs as well as in the most sophisticated audiophile system.
Specifications: Frequency Response: 10 to 25,000 Hz.
Typical Trackability (in SME Tone Arm at 1 gram tip tracking force, in cm/sec peak recorded velocity): 400 Hz - 29 cm/sec, 5,000 Hz - 47 cm/sec, 1,000 hz - 42 cm/sec, 10,000 hz - 37 cm/sec.
Output voltage (at 1,000 Hz, 5 cm/sec peak recorded velocity): 4.0 mV per channel.
Channel Balance: Within 2 dB.
Channel Separation (minimum): 25 dB at 1,000 hz, 15 dB at 10,000 Hz.
Force exerted by dynamic stabilizer: 0.5 grams.
Suggested List Price: $150.00

SPECTRA SONICS
MODEL 3100 PORTABLE, SELF-POWERED SPEAKER SYSTEM
3750 Airport Rd., Ogden, Utah 84403
(801) 392-7531
Contact: Edward L. Miller, Marketing
Date Product Introduced: September 1978.
Product Description: The Model 3100, Self-Powered Loudspeaker System, is designed to be used in locations where no sound amplification facilities exist. This system is ready for use; a very minimum of time is needed to place it in operation. It is compact and may be carried by a person of average strength. It is durable and the exterior is covered with white formica for strength and to provide an attractive, minimum maintenance finish. It may be used with or without 110VAC, and will accept either microphone or program input.
Recommended Usages: The Model 3100 may be used at ball parks, auctions, sporting events, political rallies, parades, and churches. It may be used on boats; in short, at locations where no electrical power is available.
Specifications: The Model 3100 Self-Powered Loudspeaker System is a high quality sound system that will operate independently for 5 to 7 hours. The system has three loudspeakers and reproduction of the material is free from distortion with brilliance and clarity. The Model 3100 is available now.
Suggested List Price: $495.00

(WILLI STUDER SWITZERLAND) STUDER REVOX AMERICA, INC.
STUDER AUTOLOCATOR FOR A80 RECORDERS
1819 Broadway, Nashville, TN 37203
(615) 329-9576
Contact: B. Hochstrasser, President.
Date Product Introduced: November 1978.
Product Description: Autolocating System for Studer tape machines type A80. Microprocessor controlled system with 20 memories (10 non volatile) and tape position display and locate address display.
Recommended Usages: Anywhere where fast location of a tape address is required works with all A80 transports.
Suggested List Price: $2,835.00

X.cessories & Other Equipment

(WILLI STUDER SWITZERLAND) STUDER REVOX AMERICA, INC.
STUDER A80VU MK II CHANNEL REMOTE CONTROL
1819 Broadway, Nashville, TN 37203
(615) 329-9576
Contact: B. Hochstrasser, President.
Date Product Introduced: November 1978
Product Description: Audio Channel Remote control for A80VU MK II Multichannel Recorder (16 and 24 track). Features: master switching for: Input, Sync, Repro, Safe, Mute. Individual switching of: Input, Sync, Safe/Ready. Special Features: Automatic input switching when machine is in wind or stop mode; Group select: punching in of channel groups subsequent to channels already working in Record mode.
Recommended Usages: Recording studios, to be used with Studer A80VU MKII Multichannel Recorders.
Suggested List Price: 16 channel remote: $2,875.00
24 channel remote: $3,695.00



Studer Revox America
TLS 2000-800 Synchronizing/Editing System

(WILLI STUDER, SWITZERLAND) STUDER REVOX AMERICA, INC.
STUDER TLS 2000-800 SYNCHRONIZING/EDITING SYSTEM
1819 Broadway, Nashville, TV 37203
(615) 329-9576
Contact: B. Hochstrasser, President.
Date Product Introduced: March 1979.
Product Description: Synchronizing and editing system for Studer Multichannel Recorder A800 utilizing SMPTE Code. Controls master and slave machine and up to 4 playback/effect sources. Built-in time code generator, time code calculator, time code editor, rehearse feature, phaser, varispeed etc.
Recommended Usages: For the sophisticated Recording STudio where 2 Multichannel Recorders have to be synchronized to gain more Audiotracks or for electronic editing. For the videohouses or TV stations for sound sweetening and electronic audio editing.
Suggested List Price: Basic system with built-in time code generator completly installed in trolley $25,150.00
VTR interface $1,450.00

SWITCHCRAFT, INC.
AUDIO ADAPTER KIT — L15OP1
5555 N. Elston Ave., Chicago, IL 60630
(312) 792-2700
Contact: Ron Larson, Product Mgr., Audio, Conn. & Access.
Date Product Introduced: December 1978.
Product Description: Kit contains four most commonly needed PA Connector — Adapters — Adapts 3 and/or 4-pin contact threaded-coupling microphone connectors to Switchcraft QG Audio connectors, amphenol Audio connectors and other Audio connectos with similar insert arrangements and identical number of circuits.
Recommended Usages: Recommended for sound-reinforcement and public address applications.
Specifications: Four connector/adapters in convenient pouch for compact storage. Conversion of 3 and 4-pin contact connections. Completely shielded connections for minimum hum pickup and crosstalk.
"QG" end of adapters offers: exclusive "ground terminal" that assures positive ground connection to connector shell, "ground contactors" that provide continuity between shell of mated connectors, "captive design" insert screw that won't fall out. Mechanical polarization feature.
Write for New Product Bulletin 338.
Suggested List Price: $37.50

SWITCHCRAFT, INC.
"QG" RECEPTACLES WITH PRINTED CIRCUIT TERMINATION
5555 N. Elston Ave., Chicago, Illinois 60630
(312) 792-2700
Contact: Ron Larson, Prod. Mktng. Mgr.
Date Product Introduced: December 1978.
Product Description: Three contact audio connectors with "FAS-Disconnect" or latch locking, printed circuit terminals and standoff on housing facilitate direct, stable mounting on boards, ample depth from panel allows mounting of other components such as switches and jacks. Also available with solder terminations in 3, 4, 5, 6, and 7 contact configurations.
Recommended Usages: Recommended for audio mixers, consoles, PA systems and other applications requiring high quality audio connection.
Specifications: Heavy, rugged housing with satin nickel finish. Stainless steel detent latch with 4 lbs (1.8kg) Mini disconnect force.
Closed entry contacts protect against mechanical distortion or damage.
Exclusive "ground Terminal" electrically integral with plug housing.
"Ground contractors" to transfer low resistance connection between mating connectors.
Insert insulation is high impact strength molded plastic to minimize hum and noise problems found at low signal levels.
Write for New Product Bulleting 340.
Suggested List Price: $4.60 for 3 contact version.

SWITCHCRAFT, INC.
TINI — "QG" MINIATURE AUDIO CONNECTORS
5555 N. Elston Ave., Chicago, IL 60630
(312) 792-2700
Contact: Ron Larson, Prod. Mktng. Mgr.
Date Product Introduced: December 1978.
Product Description: A new generation of miniaturized, quick grounding audio connectors designed for use with new miniature lavaliere microphones. Cord plugs and receptacles are available in 3, 4, and 5 pin contact styles. Positives latching feature prevents accidental disconnects, assures low resistance between metal housings and releases with simple pushbutton. Rugged cable clamp on cord plugs holds cable securely to protect terminations against pulling and twisting strains, accepts shielded or unshielded cables up to 0.1 inch (2.54 mm) in diameter (standard) stain nickel finish minimizes reflected glare and hot spots under intense lighting. Non scoop design protects contacts from mechanical damage.
Recommended Usages: Designed for use with new slim style miniature lavaliere microphones and miniaturized instrumentation connectors.
Specifications: Rugged metal housings with satin nickel finish.
Black end cap and cable relief clamp.
Pins and contacts are silver plated.
Plugs have internal cable clamp/strain relief.
All parts keyed for easy wiring and assembly.
Molded, dimensionally-stable, high temperature thermoplastic insert insulation.
Solder terminals, all cord plugs and receptacles are mechanically keyed for proper mating.
Send for New Product Bulletin 341.
Contact factory for price and delivery.

TABER MANUFACTURING & ENGINEERING COMPANY
TABERAMP
2081 Edison Ave., San Leandro, CA 94577
(415) 635-3831
Contact: R.H. Kearns, Marketing Manager
Date Product Introduced: March 1979.
Product Description: Record/Reproduce electronics for professional audio tape recorders. Stereo available in single unit with many standard features. Expandable from F/T to 4 trk, 8 trk, 16 trk.
Recommended Usages: Replacement to old electronics as Ampex tube type. Update Ampex or Scully electronics. With Taber heads can be matched to any professional transport.
Specifications: Send for specification information and pricing.

TABER MANUFACTURING & ENGINEERING COMPANY
TABERASER
2081 Edison Ave., San Leandro, CA 94577
(415) 635-3831
Contact: R. H. Kearns, V.P.
Date Product Introduced: New Improved Unit, March 1979.
Product Description: Bulk tape eraser 2", 1", ½", ¼", ¾" & beta video cassettes. Table top unit in rugged metal case.
Recommended Usages: Clean tape prior to use for most efficient recording. Audio or video.
Specifications: Depth of erasure −76 dB 30 Hz to 15KHz (from reference control tape).
Thermal overheat protection, 20 second cycle time with decaying field.
Suggested List Price: $495.00 FOB, San Leandro, CA.

TABER MANUFACTURING & ENGINEERING COMPANY
TABER AUDIO HEAD RECONDITIONING
2081 Edison Avenue, San Leandro, CA 94577
(415) 635-3831
Contact: R.H. Kearns, V.P.
Date Product Introduced: January 1979.
Product Description: Audio head lapping now provided on all audio heads as 3M, MCI, Revox, Otari as well as Ampex and Scully.
Recommended Usages: Tape to head contact is very critical to the efficiency of a recorder. Professional head lapping insures the highest level of head efficiency throughout its life.
Specifications: Heads are evaluated based on OEM specifications.

TABER MANUFACTURING & ENGINEERING COMPANY
TABER HEADS
2081 Edison Ave., San Leandro, CA 94577
(415) 635-3831
Contact: R.H. Kearns, V.P.
Date Product Introduced: New Improved Design March 1979.
Product Description: Ampex, Scully, 3M replacement audio heads F/T, 2 trk, 4 trk, 8 trk, 16 trk.
Recommended Usages: Replacement audio heads improve head efficiency without requiring modification to recorder electronics. Taber will provide head mounting in customer supplied assembly at no extra charge.
Specifications: All heads are made to meet or exceed OEM specifications to insure direct replacement compatibility. All Taber manufactured heads will be lapped FREE — for the duration of their normal life.

TENTEL CORPORATION
TENTELOMETER TZ-H15-UM
50 Curtner Ave., Campbell, CA 95008
(408) 377-6588
Contact: Wayne B. Graham, General Manager.
Date Product Introduced: September 1978.
Product Description: In line tape tension gage consisting of three probes which slide over magnetic tape and tape tension is then read out on a shelf contained three inch meter.
Recommended Usages: The new T2-H15-UM, is a miniaturized version of the standard T2-H20-ML tension gage and can fit into smaller areas for tension measurement. The new miniaturized probes allow use with virtually any application including measurements using modified audio cassettes or 8-track cartridges.
Specifications: The new T2-H15-UM can be used on tape widths ranging from 1/8" to 1".
Can measure tensions from as low as .2 oz (6 grams) to a maximum of 15 oz. (430 grams).
Suggested List Price: $195.00 complete with padded storage case.

T.H.E. COMPANY
"THE PREAMP" MODEL B-200
28 Music Square East, Nashville, TN 37203
(615) 320-0807
Contact: John Brandon, Vice President
Date Product Introduced: April 1979.

X-cessories & Other Equipment

Product Description: "The Preamp" is a professional low noise, high performance phono preamp possessing the new RIAA equalization curve. "The Preamp" is suitable for use with all modern magnetic cartridges because of its selectable capacitive loading and wide gain range. A subsonic filter can also be switched into the system. The unit is packaged in an attractive metal case with access holes for gain trim. Output connections are via barrier strip.
Recommended Usages: "The Preamp" was designed for use in professional environments which dictate a necessity for accurate high output level signals for entry compatibility with professional equipment. "The Preamp" becomes an invaluable tool when used with a high quality turntable and cartridge in a recording studio control room for accurate disk evaluation. Other excellent applications include disk mastering, studios, radio stations, discos and others.
Specifications: Signal to Noise (ref to 10MV input): – 72 dBv.
Output Level: Nominal + 4 dBm.
Slew Rate: 13 VMsec.
Gain Range: 37 to 57 dB adjustable.
Output: Unbalanced (Balanced optional).
Input: 47K ohms - 0 - 370 picofards selectable in 4 steps.
Suggested List Price: $250.00

UNI-SYNC, INC.
PMS-A2 PROFESSIONAL METERING SYSTEM
742 Hampshire Road, Suite A, Westlake Village, CA 91361
(805) 497-0766
Contact: Jay Simmons, Sales Manager.
Date Product Introduced: March 1979.
Product Description: The PMS-2 is an LED VU/Peak Metering device which accurately displays the output voltage of audio equipment. A 12 segment LED display on each channel provides a percentage read off from 10% to 100%. The LED's are divided into color groups of 6 green, 3 yellow, and 3 red, with one green indicating a "ready" condition and one red indicating "peak". Features include dot or bar display and manual or automatic range calibration from line level to 1250 watts All controls are front panel mounted for easy access and the unit requires only 1¾ inches of rack space.
Recommended Usages: The PMS-2 is very useful in monitoring line levels and power levels of various audio equipment, and is capable of being used at a much greater working distance than conventional meters, due to the LED's high visibility. Applications include monitoring the output of power amplifiers on stage, musical instrument amplifiers, automated systems, line level feeds from consoles and in home audio systems.
Suggested List Price: $229.00

WIREWORKS CORPORATION
MULTICABLE COMPONENTS GROUP
380 Hillside Ave., Hillside, NJ 07205
(201) 686-7400
Contact: Larry Williams
Date Product Introduced: March 1979.
product Description: Series of interchangeable multicable components including multiboxes, multiracks, multitrunk sections and multitails. (Rack and chassis mount terminal mounting configurations).
Recommended Usages: Recommended for the audio professional whose cabling requirements are variable. Wireworks wide range of products within the Multicable Components Group allow for the user to configure cabling systems tailored to the application.
Specifications: All components are available in pair sizes ranging from 3 to 50 pairs and in unlimited lengths. All feature AMP multipin connectors.

feedback

Dear Mix,
Could you tell me where I might obtain the B&B Audio's 1537-A and 202 units featured in the December Mix?

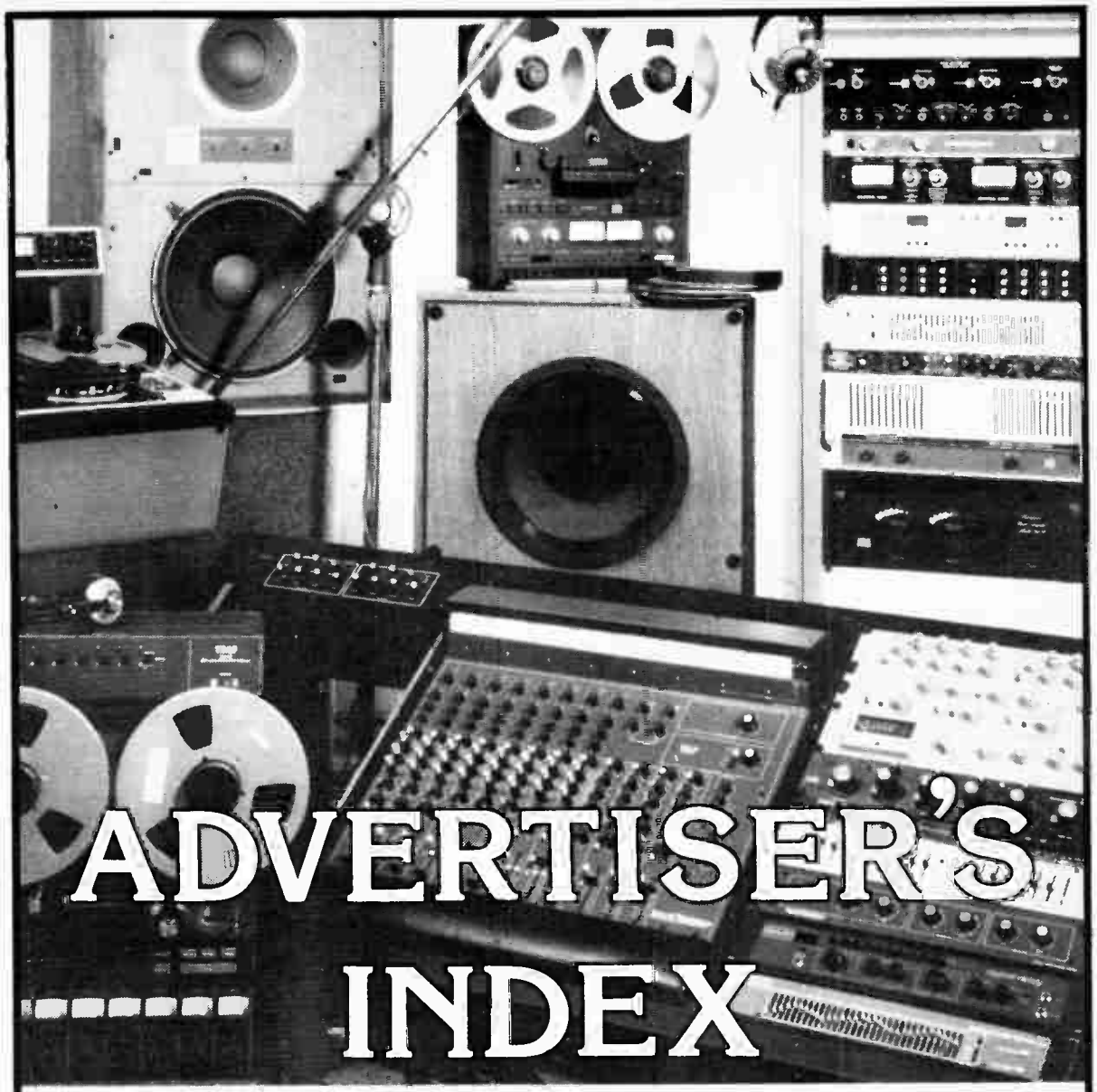
Herbert J. Peterson
Long Beach, CA

Dear Herbert,
You can write B&B Audio at 7801 Melrose Ave., Los Angeles, CA 90046.

Dear Mix,
Thank you for the copies of the March issue of 'The Mix' that you sent us recently. We thoroughly enjoyed reading the magazine, especially the article by Ed Lever on the SMPTE Time Code. However, we thought your readers might be interested to learn about the STRAMP Syncronizer. It is produced in West Germany and records a sync signal right along with the audio so there is no track loss. Although it is not SMPTE compatible and has no offset feature, its price of just $1995.00 makes it quite interesting. Versions are now available to interface with MCI, Otari and TEAC machines with DC servo-controlled motor as the slave machine. The master machine can be just about anything that will record an audio signal including video and film cameras. Further information on the unit is available from Charles Lane Studios, 7 Charles Lane, New York, NY 10014.
Sincerely yours,
Cliff Petroll
P.S. When are you going to start an east coast edition?

Dear Mix,
In your last Southern California issue (Vol. 3 issue 2) I saw a nice cipher (page 86) containing information that Mix magazine will now be publishing in New York, Nashville, Memphis, etc.
I would be very pleased if you will send me details on that.
Also if you can include your publications schedule (for 1979) for Southern and Northern California and if possible for other states (if any) too.
Thank you,
Jiri Donovsky
Hollywood Hills, Ca

Dear Jiri,
The Mix is becoming a monthly in a very short time, with each issue being circulated in the heavy recording areas of California, New York, Nashville/Memphis, Washington, and Oregon (don't take it personally other areas, we're coming your way.) Each issue will have a special listing section. Here is what the rest of year's listings look like:
July – Northern California studios, plus studios of the Northwest
September – Southern California studios
October – New York studios
November – New Audio Products
December – Nashville and Memphis studios



ADVERTISER'S INDEX

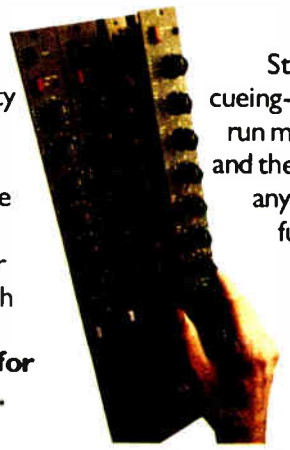
CATCH THEM IN THE MIX

The new M 12. It eliminates the three deadly sins of live performance mixing.

If a mixer can't deliver a complete range of functions, high-quality electronics and rugged reliability, it can't bring a live concert to life.

But now, Fender® introduces the M 12 Live Performance Mixer—a fully expandable 12 in/4 out mixer with staggering possibilities for both live concerts and live recording.

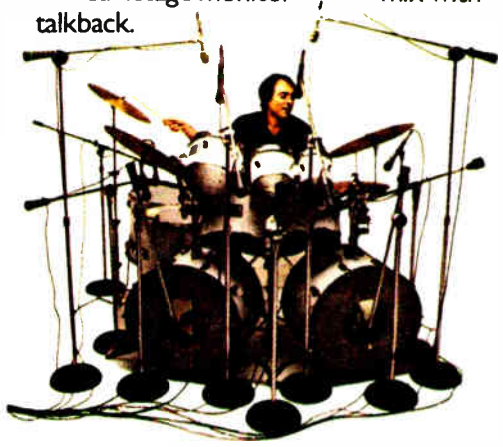
Functions you want for the options you need.



Start with submasters, limiters, cueing-talkback, hi-level in/outs that run multiple effects simultaneously and the capability of assigning signals anywhere on the board. They're functions you'd expect to find on mixers costing a whole lot more.

Mixing drums, keyboards or vocals is a job in itself. You can take advantage of the M 12's full-function design by mixing as many mike or direct inputs as you need on one submaster, then mixing the rest of your band and patched-in effects on the other.

Full cueing-talkback. Listen to Program or any of the three monitor mixes *or* any independent channels via earphones. And communicate to Program, monitors or the cue/stage monitor mix with talkback.



High-performance electronics. All Lo-z input and output channels are transformer coupled and floating. High slew rate, low-noise op amps are used throughout. Continuous gain controls allow input impedances to remain unaltered. Equivalent input noise is −128 Dbm.

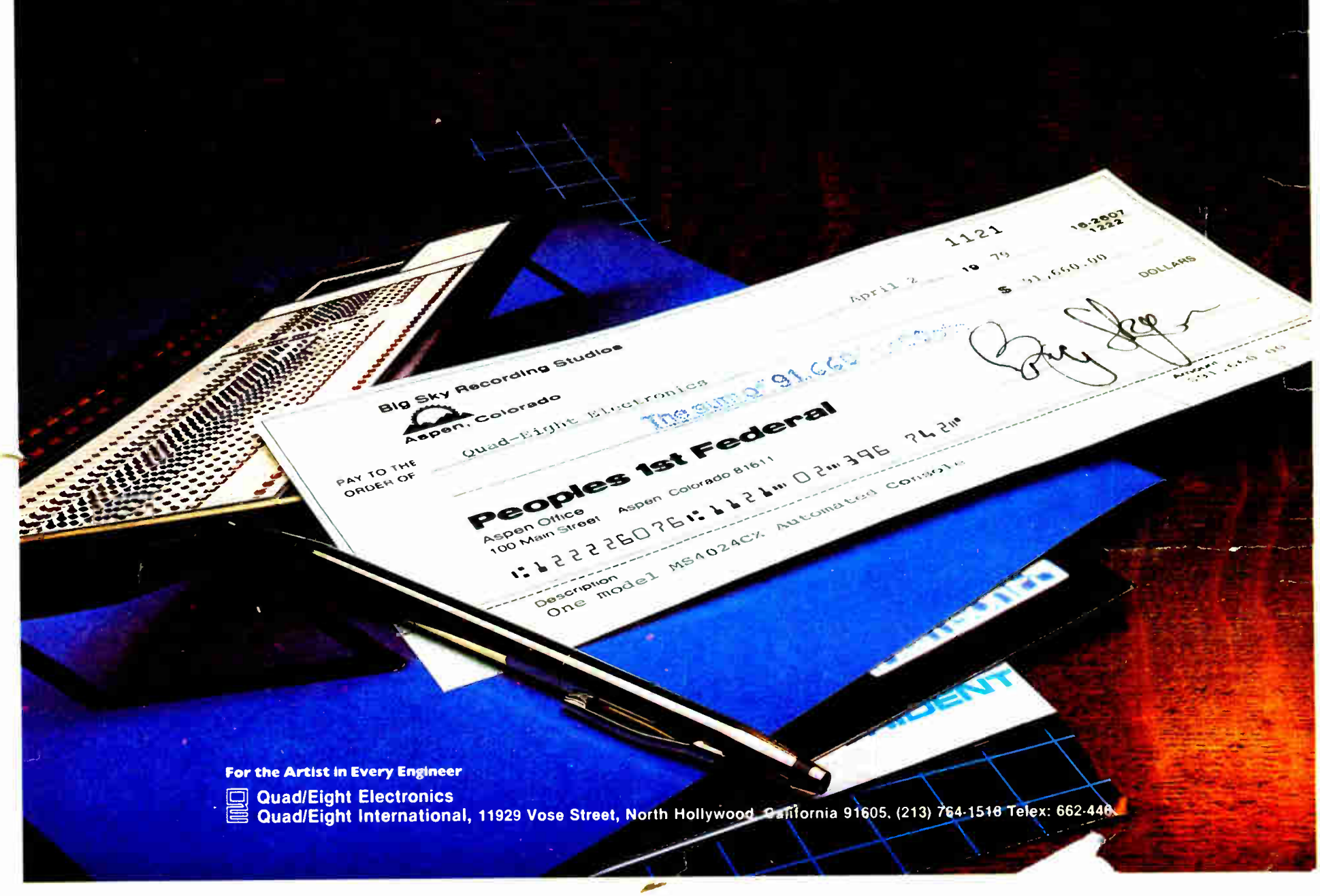
Rely on it. The M 12 was definitely designed to perform *every* time. The rigid extruded front panels and built-in case keep the M 12 mixing down when other mixers give up. And modular construction makes a rare servicing a snap.

Check out the M 12's complete value story at your authorized Fender dealer. With functions, electronics and reliability like this, the M 12 just might be a whole new standard in live performance mixers. Check it out today.

NEW from Fender®
MADE IN U.S.A.

Professional Sound Products
1300 E. Valencia Drive
Fullerton, CA 92631

Wait till the Word gets out.



For the Artist in Every Engineer

Quad/Eight Electronics
Quad/Eight International, 11929 Vose Street, North Hollywood, California 91605. (213) 764-1516 Telex: 662-446