AUDIO VERITY: If a component cannot properly reproduce the musical middle range, then its other performance attributes are irrelevant.
## Contents

**Vol. 4, No.3**

- The Ultimate Component, by Roger Sanders (Concl.) .......................... 7
- **EQUIPMENT REPORTS**
  - Spendor BC-1 speakers .................................................. 10
  - Polk Sound Cables ....................................................... 13
  - Acoustat X speakers .................................................... 16
  - IVIE IE-10 octave analyzer ........................................... 24
  - Snell A speakers ....................................................... 26
  - QUICKIES: Bryston 4-B amplifier, CM-612 preamp, Audio Perfection cables ......................................................... 29
  - Ace 3000 preamp, DB Model 6 power amp ................................. 30
  - **Recommended Components** ........................................... 31
  - **Preamp Update** .......................................................... 38
  - **Record Reviews** ....................................................... 40
  - **Manufacturer's Comments on Reports in This Issue** ................. 49
  - **Unrecommended Components** ........................................ 50
  - **Miscellany** .............................................................. 52
  - **Letters** ................................................................... 60
  - **Audio Mart** ............................................................... 80

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### About The Cover

Not all old audio components end up in the trash can! This one, a Zenith turntable, was converted by organbuilders Mann and Trupiano (of NY City) into a Zimblerstern -- a tinkling-bell stop for a pipe organ. Bell tempo is technician adjustable for 4 speeds, and the 'table can be started or stopped from one of the organ-stop knobs (marked "Bells."). The bell sound is totally free from rumble or speed variation. (Photo and data courtesy of Wm. Van Pelt, Organ Historical Society, Inc., Wilmington, Ohio.)

### Time Up?

If your mailing label bears a number code 4 or 4-3 between parentheses, this is the last issue of your subscription. See page 39.
The Centennial+1 Revolution

Despite the myriads of technological breakthroughs announced month after month with tedious regularity by manufacturers of pickups, amplifiers and loudspeakers, there are only five developments in the 101-year history of audio reproduction that we would call truly revolutionary. We will doubtless offend many by stating that Edison's phonograph was not one of them. It was the starting point, it was not a turning point. Emile Berliner's disc was revolutionary, in that it changed the whole format of sound reproduction, and made possible true mass production of recordings.

Other revolutionary developments we would count would be (2) Electrical recording and playback, (3) The long-playing record, (4) Tape recording, and (5) The stereo disc. We cannot count quadrasound because it has yet to revolutionize anything, nor do we include direct-to-disc recording because it is not new (all discs were direct prior to tape) and it is not likely to continue for long because of the next revolution, which is right around the corner. And what might that be? Digital recording is what.

Digital or pulse-code-modulation reproduction can give an incredible 90-to-100-dB s/n ratio, total freedom from speed variation and all the mechanical limitations of turntables and cartridges, distortion figures comparable to that of modern electronics (typically 1/10 that of the best conventional tape recorders), complete freedom from

1. It is impossible to mould an Edison-type cylinder recording without producing a pair of seams right across the grooved area. Dupl- cating was done by playing the original and re-recording it onto softened blank plastic cylinders. Multiple copies were made by dup- licating from several once-removed copies.

   With a flat disc, moulding is possible because the stampers can be lifted out of the grooves that have just been impressed in the copy. The moulding seams are around the outer edge where they don't matter.

2. Digital (Pulse-Code-Modulation) encoding converts the continuous energy fluctuations of the conventional (analog) audio signal into a series of pulses which are either completely On or completely Off. All of the analog information is retained as variations in either the duration or the repetition rate of the pulses. Thus, all subsequent amplification can be done by devices acting as switches, which are either On or Off. Signal degrada- tion can occur only as a result of imperfections in the circuits which do the PCM encoding and subsequent- ly, the decoding back to analog form. Recording, too, is done as a series of pulses -- dots on a laser-scanned disc, or magnetized/non- magnetized signals on tape. Perfect speed regulation of the recorder/ player is obtained by using a high-speed frequency-stabilized electronic "clock" which counts the pulses coming from the playback and
scrape flutter, and frequency response as smooth and almost as extended as a good power amplifier. And the hardware is here now. Pre-production prototypes have already been demonstrated by Sony, Mitsubishi, TEAC, 3-M/BBC, and two previously-unheard-of firms called Soundstream, Inc. (of Salt Lake City) and Tokyo Denka.

Some of the new PCM systems use the Philips-MCA disc system that was designed for video, others use digitally-encoded tape. Sony has already announced that they will be selling an adaptor that will allow their Betamax videocassette machines to function as a digital audio recorder, and Mitsubishi has unveiled a digital-tape cassette recorder/player for the audiophile market -- a cute little gadget about the same size as a Sony Betamax videocorder.

Whether any of the new systems will equal direct-to-disc quality remains to be seen. PCM tape recording will evidently eliminate all of the imperfections of analog tape, but it is more than likely that it will introduce a completely new set of as-yet-unimagined imperfections of its own. But we won't have to wait 5 years to find out what's what about PCM. The hardware exists now, albeit in prototype form, and the manufacturers have learned that there is a large market out there for top-priced hardware that can promise keeps them on a constant timebase.

PCM recordings can be copied with absolutely no degradation of signal quality, because instead of trying to re-record the original pulses as they come off the disc or tape, those pulses are used to produce another set of absolutely identical pulses, which then go onto the copy. In other words, a commercially-pre-recorded PCM tape would not be a compromised copy like a conventional cassette, or even a 1-to-1 copy of a master tape, but a virtual replica of the original master PCM tape.

There is one easy way in which the original sound can be compromised by PCM encoding/decoding, and that is if the "sampling rate" -- the repetition rate of the pulses -- is not rapid enough to resolve out every detail of the original signal. Both of Mitsubishi's PCM machines, their professional unit and the audiophile cassette, have a 47.5-kHz sampling rate. Only the ears of Stereophile-type listeners will be able to determine whether or not that is high enough.

3. Scrape flutter occurs to a greater or lesser degree on all tape recorders because tape is stretchable and there is always some friction between the head and the tape. The effect -- which is also called violining for reasons which will become obvious -- works like this: As the tape is drawn past the head by the transport, friction causes it to adhere to the head surface. The tape stretches slightly until the forward tension overcomes the friction, at which time the tape comes unstuck, slides forward to relieve the tension, then adheres to the head again. Thus, instead of a smooth motion past the head, the tape moves forward in a series of very rapid stops and starts, just like the movement of a violin bow's hairs over a violin string. But unlike the violin's bow-hair action, which produces a fundamental-and-overtone motion of the string, tape violining usually occurs randomly, producing what sounds like a hiss riding on the signal modulations, and disappearing in the absence of any signal. It is, not surprisingly, called modulation hiss. Another effect of violining is to add a rough edge to the sound of high-frequency tones coming off the tape. PCM techniques eliminate all effects of scrape flutter on the sound.
better sound than ever before attainable. We'll hand you odds-on that we'll be able to buy PCM tape equipment within the next year!

But at what price? The 3M/BBC professional 32-channel PCM system will cost "under $150,000." Not even Mark Levinson would expect to sell that to audiophiles. Mitsubishi's pro recorder is expected to sell for circa $36,000 -- still a bit steep for any audiophile. But their cassette unit, aimed specifically at the audiophile market, will more than likely go for around $2000, and the anticipated price of Sony's Beta adapter will be around $800, buying you a fully operational digital recorder/player for around $2000 -- comparable to the price of a Revox A-700!

There is no question in our mind that, once the inevitable bugs in the first digital hardware have been exterminated, both the recording industry and the perfectionist audiophile field are going to embrace it with open wallets. Imagine a recorder small enough to carry under one arm that will deliver playback quality comparable to a direct-to-microphone connection! Who would ever again consider a 60-lb open-reel unit that must gobble tape at 15 ips to produce tapes that are inferior in most ways to that cassette? What recording studio would continue using an analog recorder when a PCM unit can give virtual direct-to-disc quality along with the ability to edit and do multiple copying without the slightest signal degradation, and without the need for using either high-headroom tapes or noise reduction? Who indeed!

The recent flurry of direct-to-disc recording is serving its purpose: It is proving even to the most pig-headed reactionaries at the major record companies that sound quality will sell records, as long as the sound is truly good rather than what the RCA and Columbia recording directors (or the musicians they have brainwashed) think of as "hi-fi." Sheffield records alone has racked up sales of almost 100,000 copies -- at $12 a throw -- of virtually every direct disc they have released, and rumor has it that the initial pressing order for their latest release (of the Los Angeles Philharmonic Orchestra) will be in the hundreds of thousands! When was the last time an RCA or Columbia classical recording had an initial pressing order of even 100,000 copies? A typical symphonic recording is considered a commercial success if it sells 10,000 copies; rarely will a superstar performer like Van Cliburn bring in more than 40,000 US sales. Yet RCA and Columbia both turned us down flat when we suggested that, just as an experiment, they try putting out one no-holds-barred symphonic recording (and we offered, free, to help them do the job right.)

We would love to see the expression on those smug faces when they see Sheffield's sales figures for those upcoming Los Angeles Philharmonic recordings (which are simply stupendous!) Sooner or later, both of those creaky old dinosaurs of the recording business will see the light, because to them it is hard, cold cash which illuminates, and it must soon occur to them that good recordings make money. So they, too, will eventually discard their analog recorders and convert to PCM mastering, and when they find that that alone isn't enough to attract the sound-conscious buyer, they may even be forced to dismiss their creative record producers with the itchy fingers, toss out their 32-channel mixing consoles, and record with two strategically-placed microphones the way grownups do these days. But they will never record direct to disc. That's a little too far out in left field for a massive, conservative record company, and it may not be necessary anyway if PCM recorders turn out to be as good as they probably, eventually, will.

Of course, the repercussions of a mass switch to PCM will be considerable. It will put an abrupt
end to the manufacture of a wide variety of audiophile products which, like the buggy whip, will suddenly become irrelevant. All present disc-playing equipment and accessories will go, except for the few that are necessary to meet the demands of serious record collectors. Most of those collectors, except for the ones who value the object as much as its content, will probably copy all of their discs onto PCM tape and unload the originals at garage sales (probably minus their jackets, which will be kept for the notes and the pretty cover designs). Expensive open-reel tape recorders will become a glut on the market -- hard to sell to perfectionists for 1/10 their original cost -- as will the large-format (10 1/2-inch) reels of tape for them unless some of the digital machines can use them.

But now that the first flurry of raves about the recent PCM demonstrations are abating, we are beginning to hear reports that all is not as peachy-keen about digital sound as we had originally been led to believe. Bear in mind that, when the first PCM demos were held, the audiences were listening for all those analog tape problems that they knew all too well: The speed variations, the modulation hiss, the rounding-off of transients, and that subdued but ever-present background of hiss. They heard none of those problems at all, and came away proclaiming PCM to be the ultimate sound-recording system. But some sharp-eared recordists who have worked with digital equipment soon started hearing other, quite unfamiliar anomalies in the sound -- distortions for which there aren't as yet any descriptive terms. (We'll soon remedy that!) And lacking any convenient handles, those users could only report that the PCM recorders they had used made certain instruments sound "peculiar" or "mooshy" or "turned around." One recording engineer informed us that the extremely sharp ultrasonic filtering in a PCM unit he had worked with resulted in phase shift at lower, audio frequencies amounting to 360 degrees per octave. "Peculiar," indeed!

So while PCM is obviously destined to be the basis of the next hi-fi revolution, 100 years plus a couple after Mary Had Her Little Lamb, it doesn't look as though it will come to us bearing in hand that Holy Grail of Ultimate Perfection. As the French like to say, with that expressive shrug of the shoulders, "The more things change, the less they change." PCM will bring drastic changes in our approach to sound reproduction, and will in many ways represent a giant step closer to that Grail, but we won't be home free yet. It was inevitable that digital audio, being so fundamentally different from the old familiar analog audio, would open an entirely new Pandora's box of sonic flawdom. And naturally, if the first PCM devices are imperfect, it is also inevitable that some will be less imperfect than others. The pursuit of perfection will continue, much as it has until now. And as usual, it will be up to us picky perfectionists to guide the industry in the right direction, by purchasing the best PCM recorders and shunning the also-rans. So what else is new?

Ads: In or Out?

Many moons ago, we opened our pages to dealer ads and, a while later, did likewise for manufacturers. Now we're not so sure it was such a hotsy-totsy idea.

Getting advertisers to meet deadlines has been more of a hassle than it's worth, and much of the subscriber mail on the subject has been negative. (Although few objected when we asked for reader reactions before we started taking ads.) So we are putting it to you again: Does the presence of ads in the magazine bother you? We'll do what most of you want, IF YOU'LL TELL US WHAT YOU WANT. Okay? Okay.
ACOUSTICAL TREATMENT. In a room with highly reflective boundary surfaces, sound waves will bounce many times from surface to surface before finally being absorbed. In a concert hall the "room" boundaries are so far apart that it takes a relatively long time for a sound wave to reflect from one surface to an opposite one and, hence, for the reflections to die away. It is the time between reflections, and their gradual decay (lasting in some halls for several seconds), which gives a large concert hall its sonic spaciousness. In a hall, acoustical treatment is used to optimize the decay time (which can go on for 7 seconds or more in an untreated hall) and to prevent multiple reflections from creating out-of-phase cancellation effects which cause "dead spots" -- seating areas where audibility and intelligibility are drastically impaired.

It is obvious that our listening room will be nowhere near the size of a concert hall, so there will never be enough time delay in the room to offer any useful reverberation qualities. In fact, the reverb time in a typical listening room is too short to do anything but smear the sound. (The effect of a concert-hall "spaciousness" in a listening room is better obtained with a digital delay device such as the AudioPulse or Sound Concepts devices than through room reflections.) Thus, if we want clear sound with good imaging and resolution of detail (assuming that your speakers are capable and you have reasonable source material), then we want to minimize room reflections, and this is done by covering reflecting surfaces with sound-absorptive materials. (Although an excessively absorptive environment sounds poor, as anyone who has ever listened to unamplified music outdoors can attest.)

Sound is absorbed by most materials in a frequency-selective manner. For example, it is quite difficult to absorb bass, partly because of the physical size of the wavelengths involved and partly because of the large amount of energy in low-frequency sound waves. Bass absorption should not be needed anyway if you have dimensioned your listening room properly. Treble is so easily absorbed that additional absorption is rarely needed in any room. Most of the reflections which smear detail are mid-range ones, and fortunately these are easily absorbed by a number of available materials.

Thick carpeting is an ideal sound-absorbing material, effective through most of the audio midband. Since carpeting looks a little odd anywhere but on the floor, walls and ceilings are best treated with acoustical pads or panels made by such firms as Johns Manville Corp., National Gypsum Co., Owens-Corning Fiberglas Corp., Armstrong Cork Co., and Celotex Corp. Each has available literature, usually free, about their acoustical materials, and these data sheets should be perused before you proceed with your sound-treatment steps.
The information of primary concern to you is what is called the absorption coefficient of the material at various frequencies. This term is simply an expression of the fraction (in decimals) of acoustical energy absorbed by the material. And since absorption varies with frequency, it is customary to cite the absorption coefficients at various different frequencies. Thus: .75 at 1000 Hz means the material reflects only .25 of 1000-Hz sound impinging on it.

The absorption coefficient is often expressed as "OW" units, OW standing for "open window". One OW unit has the same amount of sound absorption as one square foot of open window. There is also a noise-reduction coefficient. This is the average of the coefficients in OW units at frequencies from 256 to 2048 cycles inclusive, given to the nearest 5%. Since an open window will not reflect back any sound, it can be seen that virtually all materials will have a coefficient less than one, since they will all reflect at least a little energy. For example, Corkoustic-B6 has an OW figure (or absorption coefficient) of 0.15 at 128 Hz and 0.75 at 1024 Hz. This is the kind of material you might use -- one with fairly effective absorption at around 1 kHz and the maximum possible absorption across as wide as possible a band above and below 1 kHz. An alternative approach, which I used, was to treat reflective surfaces with a less absorbent but cheaper material, cork, but to cover more surface area with it.*

Incidently, if you use cork you should not paint it, as is generally recommended. The coating will tend to reflect highs, and I have not found it to be necessary. Due to cost I did not use thick cork, nor did I use special acoustic cork. 3/8" cork cost me about 33¢.

* Cork is only moderately effective for acoustical treatment, in comparison with acoustical ceiling panels. And expert opinion differs as to the best way of applying sound absorption to a listening
per square foot, while thicker cork can go for at least $2 per. Since we are talking about something on the order of 250 square feet of wall the difference is staggering. Perhaps the results would be better with better cork, but I have found the acoustics to be so much better than any other room that I have heard that I have not felt that it would be necessary to pursue this.

Since the reflections which do the most damage to the sound are between oppositely facing room surfaces, it is only necessary to deaden one of each facing surface. I found that the best way to do this in my room was to use a thick carpet (deep pile is far better than shag) on the floor, and cork over most of two adjacent walls. Other methods can be used of course, such as cork on all walls and ceiling, but I found the results to be so outstanding with this simple technique that I felt no need to go further. Incidentally, window curtains and drapes will have virtually no effect unless they are extremely dense. In short, use them for decoration, as they will not mess up the sound, but don’t expect them to help much either.

WHAT IT ACCOMPLISHED. Two areas must be discussed separately here: Lows and highs. I am using dynamic woofers in transmission lines placed about 4 feet from the walls. In comparison with the three other rooms I have had these in, I notice a dramatic improvement on the smoothness of the bass. On certain sections of bass on familiar music I miss the impact that a gross bass resonance can supply, but that effect is not natural. The smoothness allows me to turn up the entire woofer level with relation to the tweeter level without causing the sound to get heavy. The over-all effect is one of great power in the bass with great clarity. Undoubtedly this smoothness is due to having the room resonances spread smoothly through the bass by proper room dimensioning. The system is crossed over at 300-400 Hz to an electrostatic speaker without any further crossovers. Electronic crossovers are used at 18db/octave, and the system is biamped with a conventional transistor amplifier for the woofer and a high-voltage, direct-coupled (no matching transformers) class-A electrostatic tube amplifier for the tweeter/midrange. The speakers were specifically designed to be as highly directional as possible. This couldn’t be done in the bass, but since large electrostatic cells are incapable of radiating sound in the direction of their diaphragms, this worked out very well. The advantage of a highly di- (To page 51)
Spendor BC-1 Speakers


These smallish systems have been getting high ratings in the English audio magazines for some years but were not available to US consumers until recently, when the small firm (literally a Mom 'n Pop enterprise) arranged for US distribution through Audio International.

The Spendor BC-1s are about as unimpressive-looking as any other smallish 3-way speakers, of which there are countless hundreds of models being made in the US at present. In fact, we were so ho-hummed by the mundane appearance of these that we found it hard to bring ourselves to connect them up and give them a listen.

Let it first be said that these do have shortcomings, not the least of which include a tendency toward mid-bass drumminess and a mild but sharp peak at around 12 kHz which adds a subtle hissing edge to the sound of massed violins. Above about 12 kHz, the high end falls off rapidly, resulting in a perceptible deficiency of airiness. This was a source of puzzlement to us, since we find it hard to understand how a system which is claimed to cross over into its tweeter at 13,000 Hz can have progressively falling response above 12 kHz. Perhaps the Spendor people can explain that one...

These also have in common with most British speakers a paucity of deep low-end range and of noise-making ability. The bottom, according to Spendor's own curves (and verified by our tests), falls off rapidly below 55 Hz, and the system is rated at a maximum output SPL (sound-pressure level) of 101 dBA. (The "A" refers to the so-called A-weighted frequency-response scale for SPL measurements. The A-weighted scale actually corresponds more closely to the ear's response at low listening levels than it does to high-level listening, but it was recommended by the Walsh-Healey environmental-noise act because it better delineates that part of the audible
spectrum which is most likely to cause traumatic damage to our hearing. It has thus become the standard weighting for most SPL measurements.) An SPL of 101 dBA is very loud for any music except for closely-miked symphonic material and hard rock, which latter doesn't really qualify as music anyway. So much for the BC-I's liabilities.

Its assets include truly remarkable reproduction of depth, and superb imaging and scale.* Instrumental placements remain stable across the stereo "stage" between the speakers, and there is no ten-

dency toward that U configuration where center instruments sound distant and vaguely imaged while flanking ones are definite but crowded towards the sides. But the BC-I's strongest asset, its musical naturalness, is unfortunately going to be lost on most audiophiles who, unfamiliar with the sound of live acoustical instruments, are incapable of recognizing it when they hear it. Despite their manifest shortcomings, these speakers can re-create the gestalt of live music like few systems -- so well in fact that we found ourselves digging out old records we hadn't listened to for years and enjoying them for their content as well as for their naturalness.

It is considered very fashionable in some misguided circles today to equate "musicality" in sound reproduction with rounded-off edges and muzzy detail, and to contrast it with "accuracy" which, it seems, implies the analytically sharp reproduction of surface noise, mistracking, and the steeliness of microphone peaks. The BC-Is do not round off details -- with that 12-kHz peak, they tend, if anything, to do the opposite -- but their accuracy is of the kind which makes discs sound the way they should in view of the microphones used and the tamperings (or lack of) that went into their mastering, rather than exaggerate their flaws (which in fact is what many audiophile-oriented systems do). Yet they manage to be so revealing of the quality of signal fed to them that they allow one to really appreciate excellent equipment up front or to suffer the consequences of using less-than-perfect ancillaries.

Both the mid-bass drumminess and that little 12-kHz peak can, however, cause problems if the BC-Is aren't carefully matched to the rest of the system. They do not, for example, fare too terribly well with most solid-state electronics, because the slight grittiness at their high end tends to exacerbate the audibility of that peak, adding a nasty sizzle to the top. Most moving-coil cartridges are out for use with these too, for much the same reason: Most have more or less of a 5-to-8-kHz brightness suckout (if you don't believe this, look at the frequency-response readout that their manufacturers usually supply), and our ears make this sound like a rising response above 9 kHz. Many tubed amplifiers, on the other hand, have a tendency toward low-end heaviness, which doesn't help the BC-Is' low end

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*Scale refers to the apparent size of musical instruments. A voice, for example, should sound neither too light nor too heavy, and should image as a virtual point source.
any. An ideal combination which we found, though, was a tubed power amp (practically any good tubed power amp) and Ace Audio's Model 3000 "pancake" preamp, with any phono cartridge that measures better than ±0.5 dB from 40 to 14,000 Hz, of which there are very few. (Stanton sphericals, the Shure V-15-IIIG (spherical) and the new Shure V-15-IV are some of them.) The Ace 3000 mates unusually well with the Spendors because of a slight error in its RIAA equalization, which places the lower part of the spectrum (below 400 Hz) about 2 dB below the range above 2 kHz. (Incidentally, Audio's curve for RIAA error (April '78 issue) disagreed with ours: Our sample was flat at the high end, and we verified our measurement's accuracy.) Other preamplifiers will do almost as well as long as they don't err in the opposite direction, toward mid-bass heaviness, and as long as their high-end isn't marred by the typical solid-state dryness or grittiness.

How do these compare with the little BBC/Rogers LS3/5a speakers? The Spendors aren't as smooth nor as extended at the top, nor are they quite as tight at the low end. But they will play louder without stress, they image just as well, they reproduce depth equally well, and they are just a mite more felicitous to instrumental timbres through that crucial musical mid-range. (The BBC's have a slight brightness suckout which needs the compensating brightness of most tubed electronics; the Spendors have no such suckout, which is why they seem to have more of a sense of aliveness than the BBCs.)

Summing up, then, we would characterize these as a music-lover's speaker system rather than an audiophile's system. Matched with suitable accessory components, they can provide a level of sheer listening enjoyment offered by very few contemporary systems. Audiophiles will not, we're afraid, be able to get much past that slight 12-kHz sizzle and the deficiency of floor-shaking low end. A subwoofer would take care of the bottom, but the high end is there to get used to or eschew.

After having lived with a pair of these for a month now, listening to a wide variety of program material ranging from commercial discs and tapes to our own master tapes of choral and full-orchestral groups in the area, we must confess that these are now our favorite $600-per-pair-class speakers, mainly because (as we have stated many times) we feel that middle-range accuracy is the single most important prerequisite of a high-fidelity reproducer, and these have that accuracy in spades along with very nearly the aliveness and "snap" of electrostatics. We cannot however overemphasize the point that, if you do not get to hear live, unamplified music more often than a couple of times in a year, you may not relate to these at all. But if we were asked to recommend the best moderately-priced complete system for the music lover/record collector who wants to live with his components for a few years instead of forever playing the upgrade game, the Spendor BC-Is would be at the speaker end of that system. (At a somewhat lower price our choice would be the BBCs, but we would have to qualify that choice with more reservations concerning low-end range and power-handling ability.)

For the benefit of those readers who are aware that Spendor makes other, larger systems, our grape-
Vine informs us that the BC-II sounds, by comparison, somewhat nasal and quite heavy over-all, while the BC-III is smoother and more extended through the low end but still slightly more colored through the middle range than the BC-I and with not as much "snap." All three use the same high-frequency driver.

One parting shot: We wish to God the English would realize that, in those parts of the world where banana plugs are used, dual banana plugs are more convenient than two separates. Many English speakers exported to the US have banana-plug connectors on them; we have yet to see one of them in which the plugs were spaced 3/4 of an inch apart so that a dual plug can be used. Is it really too much to ask that one of those little holes be moved just a bit?

(No manufacturer's comment received by press deadline.)

**Polk Sound Cables**

"High-definition" speaker cables consisting of a tubular conformation of two braided sets of stranded wire. 1628 pF/M capacitance. .013 ohms/M resistance. (1 M approximates 3 feet.) Standard lengths: 3 meters ($15), 6 meters ($30), 10 meters ($47). Polk Audio, 1205 South Carey St., Baltimore, MD 21230.

These were originally nicknamed "Cobra cables" because their braided green and copper-colored wires give them a snake-like diamond pattern. (Actually, cobras don't have diamond markings, but let's not cloud the issue with facts.) Why Polk elected to call them by the less-colorful name "sound cables" is beyond our ken, but no matter...

Although FMI's Robert Fulton has been credited with having originated the supercable for loudspeakers, the fact is that the Japanese have led the world in research into this abstruse area. They have demonstrated what we in the US have only recently begun to suspect: That considerations previously thought pertinent only to long telephone lines and to RF transmission through cables do, in fact, affect the transmission of audio signals from one end of a living room to the other. It has been proven that skin effect -- the tendency for the electrons representing high-frequency sig-

Hence the thin stranded conductors of Polk's Sound cables.

The braided construction serves a secondary purpose. Two issues ago, in a mood of April-fool whimsey, we published a tongue-
in-cheek Miscellany item about a reader who had reported that a speaker cable's sound was improved if the wire strands were twisted in a counterclockwise direction rather than in the usual clockwise direction, because the earth's magnetic field then tended to augment rather than to hinder the passage of electrons through the wire. Now we find, somewhat to our chagrin, that the direction of twist does indeed have an effect -- not because of the earth's magnetic field, but because opposing wires tend to cancel the tendency for each conductor in the cable to act like a coil in the speaker lines. The braiding in the Sound cables accomplishes the same thing, only much more effectively because the opposing inductances of the two cables are more effectively meshed than they are when two wires of opposing twists are simply run in parallel to one another.

Fulton has claimed that the length of his speaker cables is critical, down to a small fraction of an inch. One of our audio-phile contacts reported his findings when he decided to sacrifice the high cost of his FMI cables to see what would happen if he clipped them shorter, bit by bit. He reported that the loss of 12 inches of cable length made them sound "like 16-gauge lamp cord but still with much better bass." (Not having a pair of FMI cables to sacrifice in a like manner, we were unable to confirm his findings, so we will have to take his word about what happened, no matter how absurd as it may seem to be.) FMI's Fulton has never given us a rational explanation of why the length of his cables was so critical, even when asked point-blank. He intimated only that a speaker cable was like any transmission line, and that the length was important in reducing internal reflections.

We have always maintained that this is nonsense. But maybe we were wrong again. Naturally enough, Bell Telephone Labs have done the most research into the problem of what they call long lines -- problems arising, ostensibly, from the fact that telephone lines must run for hundreds or thousands of miles, where phase shift can so smear a phone-quality speaking voice as to make it completely unintelligible. They found that audio signal energy was most efficiently fed into the line, and most efficiently absorbed by the load at the other end of the cable, if the cable's characteristic impedance is the same as that of both the source and the load. If there was a mismatch at either end, some signal would fail to transfer from one junction to the next, and would then "reflect" back along the line in the opposite direction. If mismatches were at both ends of the line (as when the source and the load are matched but the cable doesn't match them), these reflections would continue to bounce from end to end of the wire until they finally died out from attrition. We have all, on occasion, heard that happen on the telephone, when something was amiss with the impedance matching: Your voice, and that of the person to whom you are speaking, sounds as if it has a long tail of artificial reverb.

But that's understandable for a hundred-mile cable run, we have argued. What bearing does that have on a 20-foot run from amplifiers to speakers? Evidently it does have some bearing. We would guess, at this point, that Fulton's insistence on speaker cables of a specific length, or precise multiples of that length, is in an attempt to reduce the smearing effect of cable reflections by having them arrive in synchronism at the load. (All reflections, remember, travel at the same speed through the cables, regardless of their frequency -- unless, of course, the cable is also introducing frequency-selective phase shift.) In other words,
loudspeaker cable designers are now taking seriously the seemingly-ludicrous view that line reflections can have an effect on audio signals through even a short run of cable. Polk's cables attack the problem the way Bell Telephone solved theirs. FMI makes no claims one way or another about the characteristic impedance of their cables. (It is probably in the vicinity of 50 ohms.) The Sound cables are rated at 9 ohms characteristic impedance — very close to the nominal impedance of most speaker systems and the design center for output impedance from most amplifiers.

So, do they work? Well, yes and no. A square wave and an oscilloscope can readily confirm the fact that a lot more very-high-frequency energy reaches the speaker system through these cables than through any conventional cables (such as heavy lamp cord), and the concomitant improvement in sound can range from subtle to marked, depending on how intrinsically good your speakers are and how bad your previous cables were. Polk's claims for the sonic improvements effected by their Cobras are a strain on one's credibility, but when the comparison is between these and a pair of 18-gauge lamp cords, the difference can only be described as dramatic. Stereo imaging is somewhat improved, the whole high end opens up and becomes noticeably crisper and more detailed, and the bass becomes substantially deeper and tighter. The effect, on sum, is virtually equivalent to replacing your power amp with one costing twice as much (or more). But, there's a catch to it.

Although the Cobras have lower capacitance than some "super-cables," it has several hundred times more (per foot) than does lamp cord. According to Polk's specs, a 20-foot Sound cable will have a capacitance of around .01 Mfd which, it seems, is deadly to some amplifiers.

All power amps exhibit some phase shift at very high frequencies -- usually beyond the audio spectrum. With proper design, the upper range is limited enough that, by the time phase shift has progressed to the point where it can turn negative feedback into positive feedback (thus producing oscillation), the signal level is attenuated to the point where it can't induce oscillation. Hanging a large capacitor (such as 0.1 Mfd) across the output of such an amplifier will cause additional high-end phase shift, but will so attenuate the high frequencies that the amplifier will remain stable. But while .01 Mfd will not attenuate the high end all that much, it can nonetheless introduce enough additional phase shift up there to shove the amplifier beyond its point of stability, and it goes into self-sustaining full-power ultrasonic oscillation.

That, unfortunately, is what the Sound cables do to certain amplifiers. (Some other "super-cables" do it to even more amplifiers.) If, like the Electro-Research (one of the models that will often oscillate with these cables), the amplifier is protected from such oscillation, no harm will be done. It will simply go into Safety, and the little front-panel lights will signal the amplifier's distress until you switch to some other kind of cable. With other susceptible amplifiers, oscillation can cause anything from amplifier over-heating to instant wipeout of fragile tweeters. Since there also seems to be a relationship here between the amplifier and the reactive characteristics of different speakers, we have a situation where the Sound cables may cause Amplifier A to oscillate with Speakers B and C but not A, and Amplifier B to oscillate with Speakers A and C but not B, and so on.

It has been argued by some that instances of oscillation with these cables are because the
amplifier is really "seeing" the loudspeaker load for the first time. That this is not so can be demonstrated by hooking the same amplifier to the same speakers with 1-foot lengths of heavy stranded cable. The oscillation ceases. Add a .01-Mfd capacitor and it sets in again.

These cables, then, can be a very inexpensive way of upgrading your system to a very worthwhile degree. With an amplifier that is not bothered by them, they afford a very small margin of improvement in all respects over the largest of the FMI speaker cables -- mostly at the high end. We are inclined to be a bit chicken about it and recommend the substantially-costlier FMIs over the Polks, simply because the FMI ones have never to our knowledge been known to drive any amplifier into oscillation, and the damage that could be done by the Polks to your system could be costly. Perhaps it is unfair to downgrade speaker cables because of design weaknesses in some amplifiers, particularly when it is more than likely that that .01 Mfd of capacitance is a direct byproduct of the 9-ohm line impedance and is thus an irreducible minimum for any ideal cable. But in this most imperfect world, the FMIs are a safer bet than the Cobra cables, unless you know someone who has used the Cobras with your model of amplifier and speakers and still has tweeters to listen to. In which case, we would most definitely choose the Cobras.

(Manufacturer's comment elsewhere in this issue.)

Acoustat X Speakers

Full-range electrostatics with integral driving amplifiers, frequency response ±3 dB 30 to 20 kHz, output level 105 dB at 20 feet, 50,000 ohms input impedance, 0.7 volts in for full rated output, 28 in. W by 48 H by 20 D at base, $1995. Acoustat Corp., 4020 N. 29th Ave., Hollywood, FL 33021

In theory, the electrostatic is the perfect loudspeaker. The force which moves its diaphragm in response to audio signals is applied uniformly over the entire surface of the diaphragm, so the whole diaphragm responds instantly and coherently to the incoming signal. And since it is not necessary to move a large surface from a small area, as when a cone is moved by a voice coil, the diaphragm needs no stiffness to keep all points on it moving in unison, and can thus be made extremely thin and light, which automatically conveys superior transient response and high-frequency response to the system. (The only thing that could have lower mass is a speaker which somehow moves the air directly, without an intervening mechanical transducing device.) And the lack of diaphragm stiffness, plus its large area of contact with the air, results in minimal resonance and a high degree of inherent damping.

Yet that ultimate goal of near-perfection which the electrostatic offers has continued to elude designers for more than 30 years. To begin with, there are the purely practical problems engendered by the high polarizing voltages -- in the 1000s of volts -- needed to get adequate efficiency from them, and the tendency for high voltages to cause air ionization (producing ozone, which is nice to smell after a thunderstorm but deleterious to one's health in prolonged doses) and catastrophic breakdowns of power supplies and insulating materials. They also require very high-voltage audio signals to drive them, which means that the output signals from the power amplifier must be stepped up by a factor of several hundred times. This has
traditionally been done with transformers, with all their attendant design problems.

And there have been other things to cope with, not the least of which is the tendency for the electrostatic's primarily-capacitive loading to drive many power amplifiers into high-frequency ringing if not into outright oscillation. Large flat electrostatic diaphragms usually beam highs like a searchlight,* and attempts to produce curved diaphragms have not been too successful to date. (The last such design was the Pickering "Isophase" tweeter of the mid-1950s, which had a tendency to short out if momentarily overloaded; the current cylindrical DR-1 from RTR is not a curved diaphragm but a series of narrow vertical diaphragm strips.) And because the grids of the electrostatic must be close enough together to produce an adequate electrostatic field at the diaphragm (for acceptable efficiency), the diaphragm is limited in excursion distance, so deep bass can be obtained only by using very large screens which can move a lot of air with relatively little vibrating motion. And so on.

Some of the early problems have been minimized in recent years through advances in transformer design and improvements in the available materials for transformer cores and electrical insulation. (Although just five years ago, Infinity nearly met financial disaster when mid-range panels in their $4000 SS-1A system started breaking down all over the place -- a problem which they blamed on their panel supplier and which now appears to have been remedied. The system is still available on special order, for around $5000.) More-recent designs have endeavored to eliminate the problems both of amplifier instability and transformer shortcomings by supplying electrostatic systems with their own driving amplifier in which high-voltage (transmitting) tubes are used to drive the speaker elements directly, without any transformer at all.

The amplifiers have an ingenious signal-switching provision that obviates the need to run their AC cables back to the preamplifier. If the speakers are fed no signals during a 5-minute period, they automatically switch to a standby mode which keeps the panels charged (but drawing no current) and the tubes lit at a very low voltage. (Power consumption in Standby mode is claimed to cost less than 1 cent per day.) Feeding the slightest audio signal to them restores full power and they are ready to play within a few seconds. They will turn on from a surface-noise click, a preamp turn-on "plop" or the sound of the stylus setting down, no matter how lightly, into the groove.

The Acoustat is a true full-range electrostatic, where an array of identical diaphragm panels is used to span the entire audio range from 30 Hz on up. I.e., it is the widest-range crossoverless

* The larger the flat radiating surface, the narrower the treble beam and the lower into the audio range beaming occurs.
How Electrostatics Work

Those of us who didn't make a career of some scientific endeavor may have forgotten this from high-school physics, but identical electrical (or magnetic) charges repel one another while different charges attract one another. Anyone who has ever unloaded an overly dry load from a clothes dryer has seen the effects of opposite electrostatic charges in the way the garments cling to each other. This is the principle of the electrostatic speaker system.

An electrostatic speaker consists of a very thin plastic sheet suspended between two wire grids or screens. The sheet is coated with an electrically conductive material that allows electrons, introduced at the edge of the screen, to spread over its entire surface. A polarizing voltage is supplied to keep the diaphragm at a high electrical potential relative to the grids. The grids themselves have identical voltages on them in the absence of an audio signal, so the diaphragm has equal electrostatic force applied to it from each grid, cancelling out to zero force. When an audio signal is applied out of phase to the two grids, this balanced state is upset, one grid attracts the diaphragm more strongly than the other, and the diaphragm moves toward that grid.

Why does it need a polarizing voltage? Why not just have the diaphragm sheet at 0 potential and apply the audio signal out-of-phase to the two grids? Figure 1 shows what would happen if we did this. As grid 1 went 500 volts positive, grid 2 would go 500 volts negative. There would be a 100-volt difference between the diaphragm and both grids, and the resulting electrostatic forces would cancel; there would be no diaphragm movement. Figure 2 shows what happens with a 2000 volt DC polarizing voltage between the diaphragm and both grids. As grid 1 goes positive by 500 volts, the difference between it and the diaphragm becomes 2500 volts, while 500 volts negative on grid 2 would make the diaphragm/grid difference 1500 volts. The electrostatic attraction would be greater between the diaphragm and grid 1, so the diaphragm would move towards that grid.
ACOUSTAT (From page 17)
speaker system available, which
gives it immediate appeal to any-
one familiar with crossover prob-
lems. There are three largish pan-
els per speaker, with the center
ones front-firing and the flanking
ones aimed outwards in a wall-eyed
configuration. All panels are
angled upwards slightly, for rea-
sons we shall shortly see.

The driving amplifiers are hy-
broids, with solid-state operation-
al amplifiers (Op Amps) in all
stages up to the drivers, and cas-
caded power tubes for the outputs.
The amps bolt onto the "floor" at
the rear of the open-backed en-
closures.

Because dipole (front-and-rear)
radiators near a wall are subject
to signal cancellation and augment-
atation at certain low frequencies,
due to off-the-wall reflections
coming back to the diaphragm in-
phase and out-of-phase with the
diaphragm motions at different
frequencies, the Acoustat ampli-
fiers incorporate R/C equalization
to compensate for these very-much-
predictable aberrations -- predic-
table, that is, when the speakers
are precisely at a certain dis-
tance from the rear wall. The
built-in corrections in the Acou-
stats are predicated on the rear
of each enclosure being exactly 2
feet from the wall; if they aren't,
bass smoothness will suffer.

Like all other dipole radiators,
the Acoustats are S.O.B.s to lo-
cate in the listening room. If
anything, they are harder to place
than most because they extend far-
ther at the bottom than most other
dipole systems, (Magneplanar Tym-
pany 3s, for instance, die above
40 Hz in most rooms.) and it is
at the low end where proper room
placement can make the difference
between too little bass, too much
bass, humpy bass or smooth and
extended low end. In addition, be-
cause the three panels in each

### Setting Up The Acoustats

Apart from the fact that these are
dipole radiators and thus produce
many off-the-rear-wall reflections
that can color the sound, they
have the added liability of fierce
treble beaming and the inability
to separate the low-end source
from the upper-range source for
individual optimizing of each.

For starters, the speakers
should be placed with the rear
ege of each enclosure 2 feet away
from the wall you would like to put
them in front of, and separated by
enough distance so that the angle
subtended by the speakers and the
center of the listening area is
around 40 degrees. The speakers
should be symmetrical with respect
to the listening area. (Fig. 1)

Next, stand behind each speaker
in turn and lean over the top of
it so you can see where its panels
are aiming. (They are parallel to
the front grilles.) Aim each speak-
er so that its two innermost beams
flank the centerline between them

![Figure 1.](image-url)

next, nearly as well.) If certain fre-
quencies or organ tones seem pro-
nounced or suckered out, try re-
listening to them with your head
at various locations in the immed-
iate vicinity of each speaker, look-
ing for a spot where the aberra-
speaker each produce a treble beam, satisfactory stereo imaging is directly dependent on the manner in which the speakers are aimed with respect to the listening area. Some additional hints for setting up the Acoustats (to supplement their own instructions) are given elsewhere in this Reports section for the benefit of those who already own a pair of them or who plan to buy them. We should add, parenthetically, that it took us a good two weeks of diddling before we got what we felt to be the best possible performance from them, and it may well take you longer. If the prospect of that puts you off, don't buy any dipole speaker system.

Before we get into a description of that "best performance," a few dispassionate observations:

First and foremost, these are very beamy speaker systems. Vertical dispersion is especially poor, requiring that you be right on the vertical axis of the radiators in order to avoid severe rolloff of highs above about 3 kHz. This is why the radiators are all aimed upwards. Nonetheless, you still must sit in order to hear these properly. If you habitually stand or perambulate when listening, these are not for you!

Second, their horizontal dispersion is pretty bad, too. Each radiator strip throws off a pronounced treble beam on axis to it, and it is necessary to locate yourself (and the speakers) so that you are precisely symmetrical to the beam-ing patterns in order to obtain satisfactory imaging. This means aiming a pair of beams directly at the preferred wall (remembering always to maintain that 2-foot rear distance), it may be necessary to
your listening seat, and not mov-
ing your head to either side (and
you must listen solo; and center-
ed), or aiming a pair to either
side of you so you are not on-axis
of any of the panels. This can al-
low two persons, seated closely
side by side, to get good instru-
mental imaging, while at the same
time hearing less of a distinct
high-end sizzle that becomes aud-
ible on the radiator axes. It is,
in fact, that on-axis sizzle that
some reviewers have initially mis-
taken for "incredible definition"
from these. The Acoustats do have
excellent definition off-axis, but
on axis the definition becomes ex-
aggerated like that of a TV picture
with the set's picture-peaking con-
tral set excessively high.

The on-axis response of each of
the Acoustat's panels sounds as if
it rises progressively above about
7 kHz to a maximum at somewhere
above 16 kHz followed by a gradual
rolloff thereafter. Off-axis, re-
response sounds flat out to around
15 kHz with a rapid rolloff above
that. The result is a deficiency
of air at the extreme top. Para-
doxically though, the system still
has the kind of quickness of attack
on transients that we have come to
associate with speakers that mea-
sure flat out to 20 kHz and beyond
-- a phenomenon which raises some
fascinating questions about the
nature of subjective transient per-
formance.

Off-axis, there is some loss of
imaging specificity, and instru-
ment localization becomes more like
that heard at an actual concert.
This is pleasing to listeners who
have heard live music recently
enough to be able to call on their
visual memory, but those lacking
this visual frame of reference may
find the Acoustat's off-axis imag-
ing to be wholly unsatisfactory.

Some samples of the Acoustats
have been found to be noisy; some
produce a low-level hum that is
audible between program selections
but is usually swallowed by program
background (auditorium noise or
surface noise), and a few have
been found to produce mechanical
rattles of the of the (easily-re-
movable) back panel or the ampli-
fier cover when reproducing deep

Rearrange the listening setup so
that the speakers are backed
against a different room wall. And
even near the best wall, it may
take a great deal of experimenta-
tion before the system sounds
truly flat at the bottom.

Once the optimal bass location
is found, re-check the angling of
the speaker panels as before, then
audition a monophonic recording (or
a stereo one with the preamp's mono
switch set to A+B blend). Make sure
both treble-balance controls are
at identical settings. There should
now be a definite, narrow image
at identical settings. The signal
should now appear as a definite,
narrow image mid-way between the
speakers, and that image should
remain near the middle as you move
across the listening area. If mov-
ing to one side makes the image
shift toward one side or the other,
slightly readjust the angling of
both speakers so as to change the
balance of the high-frequency en-
ergy reaching that spot in the lis-
tening area as in Figure 3. The

![Figure 3](image-url)
bass. The mechanical rattles take little effort to stop, by suitable shimming or, in some cases of back-panel noise, simple readjustment of panel position. The 60-Hz hum is usually largely remediable by slight repositioning of the speakers so they do not excite 60-Hz room resonances.

Over-all, the Acoustat's sound is, at best (Remember, room placement is crucial!), almost free from coloration through the middle range, albeit with a slightly distant quality due to a mild suckout in the 1- to 2-kHz range, and noticeably dry across the board. Even with a tubed preamplifier, we found ourselves wishing over and over, while listening, that Acoustat had gone the tube route entirely with their amplifier from inputs to outputs.

Despite the lack of air at the top, the system has a degree of aliveness and snap that is surpassed only by the Quad electrostats, which can't begin to touch the Acoustats on low-end range or acoustical output capability. (One review magazine based its put-down of the Acoustat X largely on its very poor showing on pulse tests. If pulse testing is supposed to indicate a speaker's ability to reproduce detail, why do the Acoustats sound so detailed? Hmmm?) The Acoustat's remarkable ability to reproduce the sound of a squeaking chair or a turning music page so realistically as to make you think they are in the room translates, in musical terms, to an extraordinary degree of you-are-there realism that tends to offset a certain coldness to the sound. String tone is superbly reproduced, with less steeliness and more richness than most of us are accustomed to hearing from transducers, electrostatic or other wise. Other instruments are accurately reproduced but not with quite the warmth they should have. (An octave equalizer lifting the 960 and 1,900 Hz bands by 2 dB can work wonders here, and if you use one as good as the Dyna SE-10, it will not cost you any audible degradation of the sound otherwise. Purists may object to this, but the fact is that there is enough dryness in the Acoustat's amplifiers to mask the miniscule amount of distortion that the Dyna equalizer adds.)

During the course of our placement experiments, we were able to elicit practically any bass characteristic from the system that we chose, from thin and lean to shockingly fat and bloated. The mid-bass peak reported by one magazine seemed to show up with one speaker placement we tried, but further investigation showed that 40 Hz was at the same level as 500 Hz, and that the ranges immediately above and below 40 were being attenuated, thus giving the appearance of a hump in between. It proved to be a room-placement function. With our ultimate placement, we obtained subjectively very smooth response through the entire bass range down to around 30 Hz, which sounds a lot deeper than it looks on paper. The output took a nosedive below that. Bass quality was judged to be slightly warm and somewhat loose, without the impact we have heard from some systems (most of which, it should be noted, roll off below 40 Hz). Yet bass drum had considerable visceral impact as well as that distinct stretched-skin attack of the real instrument. It was pipe-organ material that gave the Acoustats the most trouble, for here it seemed on occasion to "run out of juice" on sustained, heavy, deep-bass passages at listening levels of 95 dB and above -- still quite loud but not loud enough for many pipe-organ nuts.

Many people think of electrostats as being very limited in noisemaking capability, perhaps remembering the best-known wide-range electrostatic, the Quad. (Infinity's SS-1 and SS-1A electrostats could make plenty of noise.) The Acoustats can't quite equal the SS-1As in clean output, but they will easily produce 95 dB of SPL (loud enough to have to shout over) without strain, and they
don't start to break up until around 105 dB. (At 100, some strain is perceptible as a slight hardening of the high end.) An SPL of 90 dB is loud enough for all symphonic recordings except those miked very closely, which need about 100 dB to sound "right."

Depth is only moderately well reproduced, in comparison with some other systems, but the relative distances of instruments from the microphones were readily perceptible. Imaging, as we said, ranges from poor to quite good but never superb.

Taking these in perspective, then, it would seem that the main thing going for them is their rare combination of extraordinary detail and aliveness with a high degree of listenability. You can play an old Columbia Philadelphia Orchestra /Ormandy disc on them, and hear the steeliness in the strings, yet not be all that bothered by it. You can hear a truly remarkable degree of inner detail in any recording you play through them, and can at times convince yourself that you are listening to live musicians in the room. But this is not a system that will appeal to everyone, by any means. Not only is it inferior to many other systems in some respects, it is markedly inferior -- in treble dispersion, for example. And many audiophiles dislike the Acoustat's commitment to one power amplifier; they prefer to choose their own. While we agree that the amps that are tied to these could be better (we assume that it is the amplifiers that cause that slight dryness), we cannot agree that it is always best to choose your own amplifier, for the qualitative differences between today's better power amplifiers are far less significant than the differences in bass performance, balance, naturalness and treble performance which result from the amplifier/speaker interface. In fact, two speakers which sound completely different with any one amplifier can often be made to sound virtually identical just by mating them to amplifiers whose characteristics best mesh with theirs. And there are probably no more than two amplifiers which are really ideal mates for any top-quality speaker system, and vise versa. Speaker/amplifier integration is an ideal situation, not a disadvantage. And the sooner audiophiles come to realize this, and to demand that manufacturers produce amplifiers and speaker systems for each other, the sooner speaker/amplifier mating will cease to be the hit-and-miss proposition that it is today.* So much for our gratuitous comments about the built-in amplifiers in the Acoustats.

Where, then, would we rate these relative to the competition? First it must be said that there are many other speakers that do practically everything better than the Acoustat Xs. Practically none of them, however, is capable of sounding as alive or as remarkably detailed as the Acoustats. These, then, are a curious admixture of strong plusses and strong minuses. Whether you will adore them or abhor them depends entirely on your listening preferences. We could live with them; a few other audiophiles who heard them here thought they were abominable. But then, with perfectionists there is no such thing as "good." A product is either stupendous or horrible. These, in truth, are neither. It is interesting,

* It is a constant source of amazement to us how it is possible, after we have made a point (to tedium) about how important it is that a certain speaker be used with a certain kind of amplifier, for so many dumbheaded readers to tell us how wrong we were about the speaker because it doesn't sound that way on their different kind of amplifier. This is like saying a certain steak sauce is lousy because it ruins the taste of coffee!

One of our basic assumptions in Stereophile is that our readers are brighter than the average bear. That sort of thing gives us pause.
though, that not one of the Acoustat’s detractors has argued with our contention that, dollar for dollar, a pair of these represents one of the best buys to be found in high-end audio today.

(Manufacturer's comment received too late for publication. It will appear in the next issue.)

**IVIE Octave Analyzer**

Hand-held battery-powered audio signal measuring device for SPL and octave analysis. Sensitivity 45 dB SPL to 145 dB SPL, or -110 dBm to +9 dBm using external-source jack. Accuracy ±1 dB. Octave filter center frequencies at 32, 64, 125, 250, 500, 1k, 2k, 4k, 8k, 16 Hz. Response linearity ±0.5 dB. SPL weightings A and C. 10-channel 160-LED display. Dynamic range of display 45, 30 and 15 dB. Edge-lit graticule. Rechargeable Ni-Cad battery, 3-hour recharge, approx. 2-hour operation. Optional AC-line operation. 15 oz weight. 2-3/4" W x 6 H x 2-5/8 D. $650. Ivie Electronics, Inc., 500 West 1200 South, Orem, UT 84057.

This little gem of miniaturization has what we have often thought of as "wantability." That is, it is the kind of gadget that one simply looks at and says "I want it."

Whether or not one can justify its not-insubstantial price of $650 is very moot, for while this can be a very useful tool for the technically knowledgeable, it can also be a source of, not only frustration, but misinformation for users who don't comprehend how the thing works.

The IE-10E is capable of making sound-pressure-level readings with one standard frequency-response weighting curves (A and C, neither of which is flat across the spectrum), or an octave-by-octave analysis of SPL from center-frequencies 32 Hz to 15 kHz with better than 0.5 dB accuracy. The device uses an array of light-emitting diodes (LEDs) for its display, and offers a choice of 3 resolution ranges on the octave display, from 3 dB per indicated step to 1 dB. Thus, the widest range of dB variations is shown with the 3-dB range but the resolution is only a little bit better than 2 dB. The 1-dB range displays the narrowest dB variation but with the greatest resolution: ½-dB increments are indicated by two LEDs glowing at

The IE-10E is 1½ times the length of a pack of regular-size cigarettes and weighs just under 1 lb.
equal brightness, and 1/4-dB increments can be estimated by the fact that one LED glows more brightly than the one above or below it on the scale.

The LED display brightness is internally controlled to compensate for levels of ambient light, to allow readings to be taken in total darkness or sunlit open shade with the minimum battery drain necessary for each ambient level. The scale calibrations (graticule markings) also become automatically illuminated when the ambient lighting drops near the point where they might be difficult to see.

The unit contains rechargeable Ni-Cad batteries that are good for from 2 to 3 hours of use, depending on drain rate, and comes complete with an external charger (which is usable as a power source so readings may be taken during recharge periods). Also supplied is a short interconnecting cable with RCA plugs at both ends. The IE-10A has RCA receptacles for connecting an external source, and for drawing signals out of the device so that its internal preamplifier can be used as a sensitivity booster, or its display can be fed to external readout equipment such as an oscilloscope.

Readings may be taken either from an external signal source or from the IE-10A's built-in pressure-sensitive microphone. The front of the device, around the probe microphone, is tapered to minimize diffraction effects.

The whole thing is slightly larger than a pack of 100-mm cigarettes, and has a most substantial heft to it, weighing in at around 1 lb.

Accessories are available to provide a wideband signal source (pink or "white" noise), or to allow the IE-10A to be used for harmonic-distortion analysis.

The device has an almost-infinite variety of applications in audio, from quick setups of tape recorders (you can see the mid-range and high end simultaneously for an indication of the effects of both biasing and HF equalization) to instant checks of spectral balance from loudspeaker systems or live-music sources. In the latter functions, the LEDs give instantaneous-peak indications with a slower decay. For pink-noise analysis, which requires averaging of the measured energy to prevent random flickering of the LEDs, there is a signal-averaging mode which can be selected by a front-panel switch.

Gauged in terms of measuring power per cubic inch, this is reasonably-priced at $650 list. (The signal generator and distortion analyzer cost, respectively, $195 and $260 extra.) Whether it is all worth the money to an audiophile depends on his technical expertise, for the device requires much understanding and some interpretation for its proper use. In the

* Pink noise and white noise are both varieties of wideband random noise. Pink noise has equal energy per octave, whereas white noise has equal energy per frequency. Since adjacent frequencies are more closely-spaced with increasing frequency, white noise exhibits a rising response through each octave with rising frequency.
hands of an uncomprehending user it can purvey a wealth of misleading information. For example, because the IE-10E averages the measured energy within each octave, it may not respond at all to a sharp response peak that is right next to a dip of comparable amplitude when making octave-analysis measurements. Pink-noise measurements can indicate only the average energy per octave; finer distinctions can only be made by using a swept sine-wave oscillator and the IE-10A's total-SPL mode. But when using the latter it is necessary to bear in mind that there is internal weighting which rolls off both the high and low ends of the audio spectrum to predetermined specifications, so corrections must be applied when that mode is used for frequency-response measurements. (These can be derived from the weighting curves shown in the unit's very comprehensive operating manual.) The manual is in fact the key to proper use of the device; it must be understood in its entirety before one can use the IE-10A reliably, and an understanding of it does, unfortunately for many of us, require a certain amount of technical sophistication. (We would in fact strongly advise ordering the manual for $4 from IVIE before buying the IE-10A. If you can't understand the manual, you won't get your money's worth from the analyzer.)

If you can cope with the technicalities of this, it is an invaluable tool for the professional or the serious dabbler. There is nothing comparable to it available, and it works so well that one feels no need to explore competing devices anyway. (IVIE also has a much-more-sophisticated and expensive device which can measure 1/3 octaves and, with an add-on microprocessor, can do reverb and detailed spectrum analyses, but that one is strictly for the practising audio engineer.) For those who can use the IE-10A, we cannot recommend it too highly. For those who can't -- and this is something only the prospective buyer can assess -- it would be an ostentatious waste of money.

Another magazine recommended this very highly for "dealers and serious audiophiles." We think that was both irresponsible and dangerous. Serious or not, most audiophiles (and a shocking number of dealers) just don't have the technical smarts to use this to advantage, and there are all too many dealers who will use it to browbeat unsophisticated buyers into hearing things their (more-profitable) way. Like atomic energy, this can be a tool or a weapon.

(No manufacturer's comment received by press deadline.)

Snell A Speakers

Three-way dynamic with 10" woofer, 4" mid range and 1" dome tweeter. Crossovers at 300 and 2500 Hz. 4 ohms impedance. No power-handling specification. 24" W x 13D x 464 H. 97 lbs. $1370 per pair. Snell Acoustics, 10 Prince St., Newburyport, MA 10950.

One of the less-glamorous speaker systems around today, these have more to offer the critical listener in terms of satisfaction than do most of the more-exotic designs.

Although you'd never know it from the boxlike external appearance, the enclosure design is quite unconventional. The front panel which mounts the mid- and upper-range drivers is curved like one side of a cylinder. This eliminates the typical, abrupt corners at the edges of the front panel, thus minimizing the diffraction effects which cause sharp mid-range response irregularities and, hence, impaired stereo imaging. The system comprises two physically separate enclosures, one for the woofer and the other for the two upper-range
drivers, which stack one upon the other. Locating pegs between them keep them aligned. The two boxes are electrically connected by a short length of cable with dual banana plugs at both ends, so it is a leadpipe cinch to separate them for biamplifying. Although we normally recommend biamping any speaker for best possible results, it will not buy you as much improvement in the Snells as in most, because it is impossible to bypass the internal crossover element which rolls off the low end of the mid-range speaker. Additional attenuation there, from an external electronic crossover, will cause excessively sharp rolloff and, consequently, incorrect phase-shift relationships through the crossover region. The result will be a hole in the response there. The electronic crossover should be used only to attenuate the upper end of the woofer. The upper-range amplifier should be operated full-range or, if there is such a provision on the crossover, rolled off below 70 Hz or lower. Our tests were conducted with the speakers monamped; biamping will slightly improve all aspects of low-end performance but will afford little improvement through the upper ranges.

A two-position rear-panel switch on each speaker affects the system's high-end contouring, not by changing tweeter level but by changing the slope of the entire high-end response. This was one of the more useful controls of its kind we've encountered, for -- whether by design or happenstance -- it almost exactly compensated for the difference in high end between good tube and good solid-state amplifiers. With the switch in its "normal" position, we found the high end to be natural with tubes and a little hot with transistors; with it in the "decrease" position, highs were correct with transistors and dull with tubes. We used the appropriate settings for our tests.

How, then, did the As sound to us? On the positive side, they image superbly -- as well as any system we have heard -- and reproduce instruments in their proper apparent size. Their treble performance is excellent -- extremely smooth and velvety but subtly closed-in at the extreme top. Over-all balance is very good but the system has a somewhat warm sound rather than being entirely neutral. Bass is clean, subjectively flat to 30 Hz (with transistors), and with very good detail (although not the equal of the better transmission-line-loaded systems). But...

The system has a subtly recessed quality, as though the middle range is somewhat depressed. The sound...
in this respect is similar to that of the Rogers/BBC LS-3/5a minis reviewed here recently, although the Snells have less of the mid-range suckout than do the BBCs. But the fact that the Snells don't have the slightly whooped-up bottom of the BBCs makes amplifier mating rather more of a problem. Neither speaker really comes to life without the addition of a bit of brightness in the signal. With the BBCs, this was easily done by using a tubed power amp; the typical tube brightness offset the mid-range depression, while the slight sparseness of the tubed amps at the extreme low end had no effect on the BBCs. They don't extend that far down. With the Snells though, the added presence of the tubed amplifiers was offset by their tendency to make the low end somewhat loose and, at the same time, thin at the bottom. Solid-state amps, most of which elicited stunning low end from the Snells, did nothing for that slightly deadish mid range. In short, no amplifier that we tried could yield equally good performance from the Snell through both the middle range and the low end, and we cannot think offhand of any amplifier that might fill the bill. As with the Acoustat Xs, a good equalizer solved the problem neatly and, in the case of Dynaco's SE-10, without adding any other signal degradation that anyone was able to hear (that is, until it was pointed out to some listeners that the equalizer was in circuit, after which they were able to hear "quite clearly" how much the SE-10 was muddying the sound). We are confident however that logic and common sense will not persuade any dedicated perfectionist to pollute his system with any equalizer, no matter how good. The A's will produce scads of volume without strain, up to well beyond the needs of most sane listeners, and they are fused in case you overdo things anyway. The only time we found ourselves popping fuses was as a result of our (defective?) Ampzilla II generating severe subsonic pulses at high power levels. But fuses are cheap.

For the audiophile, these are an ideal choice in their price range, as they do everything that he listens for quite a bit better than do many systems costing substantially more.

For the music listener who is intimately familiar with live-music timbres, though, we can recommend the Snells only if mated with another component in the system that will liven up the presence a bit, such as a tubed preamp (for brightness) and a solid-state power amp (for optimum bass performance).

All in all, though, these are really hard to fault without the kind of nit-picking we just succumbed to. Few people, we suspect, will be disappointed with them, which is something we cannot say of too many speakers in any price class.

(No manufacturer's comment received by press deadline.)

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**Coming Up**

In-house now for upcoming reports are the SME 3009-III arm (which we are already working with), two modified Rabco SL8-E arms, Nikko's Alpha and Beta I amp and preamp, speakers from Ultraphase and Servo-linear, Infinity's mini QE speaker systems, the Audionics PZ-3 power amp, headphones from Supex and Fontek, the Shure V-15-IV, Pickering XSV-3000 and Microacoustics 2002-e cartridges, and the Watson speakers. More goodies are expected momentarily.
Quickies

Bryston 4-B Amplifier

In most respects the best solid-state power amp we have tested, this may well be (judging from scuttlebut) the best one currently available, but it is definitely not without personality.

It has outstanding definition, depth, and an open, airy, almost-textureless* high end and a subtly laid-back brightness range. The over-all sound seems neither dry nor liquid. But it is at the low end where this unit departs from the norm. The bottom, although awesomely tight and concussive, is quite heavy. The result with most systems is a very impressive but singularly unnatural fatness. (At least one other "underground" magazine was so carried away by that awesome low end that they declared the 4-B to be their new "reference amplifier" without recognizing that it was heavying-up the low end of most speaker systems.)

For a system that now lacks low-end weight, this is an ideal amplifier. For others, the billowing bottom may be too steep a price to pay for the amplifier's positive attributes.

Incidentally, Bryston informs us that they are currently back-ordered on the 4-B, and that customers may have to wait a while before taking delivery of their unit.

Bryston also manufactures two other, lower-powered and lower-priced amplifiers which also do a very creditable job. In view of Bryston's back-order situation, though, we will postpone our reports on those until it looks as if they may actually be available.

*Texture implies that the sound seems comprised of particles of energy rather than a continuum of fluctuating energy. Texture can range from a very fine-grained "dryness" to a coarse roughness that can be likened to gravel.

We can say, though, that the 2-B and 3-B are sonically comparable to the 4-B (at lower power levels of course), but with a more "normal" low-end weight. The 2-B in particular is a bargain at the price...if you can get it.

CM 612 Preamp

One of the most neutral preamplifiers available, in terms of over-all balance, this struck out on such matters as texture, harmonic structure and detail. By comparison with the best preamps in those respects (the Conrad-Johnson, Hafler and Audionics), the CM was coarse-grained almost to the point of grittiness, very dry, deficient in inner detail and depth and lacking in low-end impact. Extreme highs seemed almost completely absent, and overtones of instruments like violins and cymbals were rough and steely, and the underpinnings below the harmonics of other instruments seemed oddly muted, as though, for example, the clarinet reed was being played without its body attached. Definitely not a winner!

(No manufacturer's comment received by press deadline.)

Audio Perfection Cables

Two issues ago, we reported that the special shielded audio cables from FMI were the best of any available from any source. We were a little wrong about this. While we had tested others from the manufacturers who were making them available, we had not until recently encountered these from dealer Audio Perfection.

They seemed in every respect to be the equal of the FMI cables. An excellent buy, we thought, at substantially less money than FMI charges for theirs. In fact, these looked so much like the FMI ones that we were moved to ask Audio Perfection's Mark Balkowitz how come. If he was indeed selling the FMI cables, how could he
charge less for them? Seems we had it the wrong way 'round. It was he who had been supplying FMI with their cables, and FMI was marking them up. So, if you want the kind of performance we reported for the FMI cables -- better detail, cleaner and more open, airy high end -- but would like to pay less for it, order them from FMI's source: Audio Perfection, 822 Regent Dr., Apple Valley, MN 55124. Their price is $15 per pair, as compared with $23 from FMI. The same for less; sometimes it actually happens!

Ace 3000 Preamp

Ace is a small, vigorous company dedicated to providing the best possible audio quality at the lowest possible cost. Actually, that description could fit a number of component manufacturers, but Ace differs from most in that they accomplish their goals more consistently. This preamp is a real little sleeper!

It is as basic as a preamp can be, lacking even such amenities as a stereo/mono switch. Tone controls, of course, are also omitted. Fortunately the Tape Monitor provision was not omitted, so the user has the option of adding an external equalizer if he so wishes.

Two versions are available, one with an outrigger power supply connected to the preamp via an umbilical cable, the other with the power supply within the compact, thin-profile preamp case. The outrigger provides slightly lower hum; we found hum to be inaudible in the built-in version with any but the lowest-output cartridges, and the hiss was high enough with those to make the use of a pre-preamplifying device pretty much necessary anyway.

Sonically, the Ace 3000 has a distinct flavor, due to some inaccuracies in the RIAA phono equalization. The error causes the frequency response to shelve at around 1 kHz, with the range above 1 kHz being about 2 dB elevated above the range below 1 kHz. As a result, the preamp sounds rather forward and lean, with a slight "ah" coloration in the middle range. Outside of that little problem, the 3000's sound is exemplary in every way. The low end is extremely deep and taut, the high end exquisitely sweet and musical although very slightly deficient in air. Over-all definition is excellent, as is the reproduction of depth with appropriate program material.

Because of its RIAA oddity, this should be mated to a system which will complement its own idiosyncrasies: To a cartridge that tends to be warm and fat, like most Grados and the custom mods based on Grajos (such as the Promethean), or a speaker that tends toward the same (such as the IMF Studio series). When appropriately mated, this is one of the most listenable, livable preamps available. Its high end, interestingly, makes it equally compatible with dynamic or electrostatic tweeters, unlike for example the Conrad-Johnson, which sounds closed-in with dynamics and fine with electrostats.

(No manufacturer's comment received by press deadline.)

DB Model 6 Amplifier

Quite modestly powered at 45 watts/channel but not so modestly priced at $650, this is in our opinion a dubious value. Sonically, it has several things going for it -- a very sweet yet open, grainless, un-transistory high end, excellent definition, fairly good rendition of depth, a transparent but slightly recessed middle range, and marked freedom from nasal colorations. But it just doesn't have the guts to produce comparable low-end performance from any but the most highly-efficient speaker systems. Lows from all of the speakers we had on the premises were in proper balance but were notably deficient in vis-
Recommended Components

Each component listing on the next few pages is followed by a series of numbers, each corresponding to one of the numbered notes on the following pages. If you are only interested in knowing what components we are recommending to buyers, just ignore the numbers. If you are curious enough about a component to want to know more about it, or to ascertain how it would "mesh" with your present components, take pencil and paper and jot down each of the numbered Notes pertaining to it. The result will be a capsule "Quickie" report on that component.

Components listed here are ones which we feel to be the best available in each of four quality classes, based on all of the information available to us at time of publication.

Components are selected for listing on the basis of our own tests as well as reports in other magazines and from users. The ratings are predicated entirely on performance -- i.e., accuracy of reproduction -- and are biased to an extent by our feelings that things added to reproduced sound (flutter, distortion, various forms of coloration) are of more concern to the musically-oriented listener than things subtracted from the sound, such as some deep-bass or extreme-treble range. On the other hand, components which are markedly deficient in one or more respects are down-rated to the extent to which their deficiencies interfere with the full realization of the program material that is likely to be fed to them.

Some of the items listed here-under are discontinued models (*), listed here because their durability and performance distinguish them as "classics", and because they are sometimes available used, at substantial reductions below their original cost.

Component classes are as follows:
CLASS A: Best attainable sound, without any practical considerations; "state of the art."
CLASS B: The next best thing to the very best sound reproduction.
CLASS C: Somewhat lower-fi sound but far more musically natural than average home component high fidelity.
CLASS D: Satisfying musical sound but significantly lower fidelity than the best available.

The order in which components are listed in each class has nothing whatsoever to do with their quality, relative to that of others listed in the same class.

Components which are judged to rank near the bottom of one class and the top of a lower class are listed in both classes.

Some component categories have no D-class listings. This is because we have yet to find one of that class which is that much better than the competition to warrant singling out.

The following changes in the list have been made since the last issue:
- Denon 3500 turntable superseded in Class A by 2000 or 2500.

(To page 37)
Turntables
(A) Denon DP-2000
   Linn-Sondek LP-12 (20)
(B) Denon DP-1500
   Thorens TD-160
   Acoustic Research 77XB (30,20,27,29)

Cartridges
(A) Shure V-15-IVG (4,11,13,15,80,118,156)
(B) Shure V-15-IIIG (4,11,13,15,80,118,162)
(C) Shure M-95G (11,12,13,80,118,162)

Tone Arms
(A) Mayware Formula 4 (16,20,136,138,192)
   KMAL (19,20,22)
(B) Grace 707 (28,195)

Tape Recorders
(A) Revox A-700 (34,46,138,157,181,189,192)
   Sony TC-177SD (39,46)
   Nagra IV-SL (36,38,46,62,80,161,185,189,190)
   Stellavox SP-7 (38,43,46,62,185,189)
(C) Harman-Kardon 2000 (195)

Microphones
(A) Sony C-500* (56,80,138,157,166,181,192)
(B) Sony C-37FET (55,56,80,138,157,166,180,181)
   Beyer M-500 (56,58,80,135,163)
(C) PML DC-20 (56) or DC-21 (55,61,62,138,160,163)
   Beyer M-260 (56,80,137,139,162,178,184)
(D) Advent MDC-1 (55,135,139,158,164,183,195)
   Beyer M-550 (55,80,135,139,163,164,183)

Tuners
(A) Yamaha CT-7000 (69,136,138,157,161,165,181,189,192)
   Sequerra I (69,136,138,157,161,165,186,189,190)
(B) Kenwood 700T (69,136,161,184)
   Yamaha CT-810 (69,156,157,161,181,195)
(C) Dynaco FM-5, AF-6 (68,77,135,161,185,195)
(D) Dyna FM-3X* (67,156,178,181)
   Quad FM-3 (67,157,181,185)

Receivers
(C) Advent 300 (68,99,137,156,178,180,195)

Preamps
(A) Audionics BT-2 (75,78,88,94,136,138,157,161,181)
   Conrad-Johnson (78,92,136,156,181)
   (Paragon preamps not yet tested)
(B) Hafler DH-101 (For "Notes" see A above.)
   Audio Research SP-3A-1* (137,138,156,157,181)
(C) Ace Audio ZDP (77,78,79,136,162,181,185)
   Dynaco PAS-3x* (83,84,137,138,156,184)
   Quad 33 (79,86,136,157,158,161,181,193)
   Ace 3000 pancake (77,78,128,130,135,156,194)
Amplifiers
(A) Audio Research Dual 150* (88,91,92,95,135,157,165,181,189,190,192)
   Berning (94,136,138,157,161,186,193)
(B) Paoli 60M (98,136,138,157,158)
   Bryston 4-B (95,126,136,137,157,158,180,181)
(C) Dyna Stereo 410 (77,94,125,136,163,186)
   Son of Ampzilla (77,94,138,163,186)
(D) Dyna Stereo 70* (77,92,137,156,178)

Speaker Systems
(A) Infinity SS-1A (88,103,107,108,110,112,115,118,128,136,138,150,
   157,165,166,181,189) (Available only on special factory order)
   Acoustat X (88,90,115,136,150,165,161,186,194)
(B) IMF Monitor IV (100,106,118,119,127,138,140,156,180,191)
   Rogers/BBC LS-3/5a & M&K BT-II woofers
   (100 Hz xover) (88, Bass 106, Upper 108, 118,119,121,122,127,136,157,
   159,165,181) (biamplified with deCoursey xover and Crown DC-300A)
   M-Z Mod 3 (106,118,119,122,128,136,156,193)
   Acoustat X (For "Notes" see A above.)
(C) B&W DM-6 (88,106,120,123,137,139,157,161,165,193,194)
   Rogers/BBC LS-3/5a Mini Monitor (88,99,100,108,113,119,121,122,127,
   136,139,137,159,165,181)
   M-Z Mod 2 (106,118,119,122,128,136,139,156)
(D) FMI 80 (108,113,118,119,127,135,156,158,165,185,195)
   FMI 100 (113,118,119,126,137,139,156,180,195)

Headphones
(A) Infinity ME-10D (Selected Sample) (88,108,136,146,149,150,153,
   155,157,166,181,189,197)
   Stax SRX Mk I or II (SRD-7) (108,137,146,149,150,153,155,157,158,165,
   166,181,189,195)
(C) AKG 240 (105,108,128,136,148,153,155,158,163,165,186)
   Beyer DT-480 (106,137,148,152,156,180)

Miscellaneous Devices
(A) RTR ESR-6 Add-On Tweeter (108,121,150,157,165,166,181,189)
   Russound QT-1 Patch/Switching Box
   M & K BE-IIA Add-on woofer (103,114,131,134,137,138,140)
   Audio Perfection Shielded Cables (157,165,166,189)
   FMI Loudspeaker Cables (88,136,138,157)
(B) M&K B-II Add-on woofer (103,114,131,134,137 (unless 111),140,195)
   Dynaco Octave Equalizer
   dbx 119 Program Expander/Compressor
   dbx 157 Tape-Noise Reduction System
   Audiopulse One
   Sony MX-14 Mixer

Disc-Care Products
   Discwasher "Zerostat"
   Watts "Dust Bug" (Used dry)
   Discwasher "Discwasher"
   Decca Brush
   KMAL Record Cleaner

* Discontinued model.
NOTES

1. Low output; use step-up transformer.
2. High-level RIAA-equalized output.
3. Substantial sample-to-sample variability; should be individually selected.
4. Outstanding tracking ability.
5. Do not exceed manufacturer's recommended maximum cable capacitance.
6. May interact poorly with some preamps.
7. Stylus damping often deteriorates in a few months.
8. Excellent 78-rpm stylus available.
9. Some mistracking of very loud modulations.
10. Mistracking inconspicuous when it occurs.
11. Mistracking unpleasant when it occurs.
12. Spherical tip; smoother at high end than elliptical.
13. Requires 5-1/2 inch depth below top of platter.
14. Use only with lightweight high-compliance cartridges.
15. Use only with cartridge tracking at 1-1/2 grams or less.
16. Outstanding immunity to acoustic feedback.
17. Use non-detachable-headshell model if possible.
18. Mercury contacts have too much resistance for use with some moving-coil cartridges.
19. Poor arm-lift device; discard and use damped add-on lifter (Ortofon, Supex).
20. Adjust turntable suspension for extra weight of arm.
21. Some mid-range rumble audible at very high listening levels; whirring noises audible from close proximity to arm.
22. Often delivered in need of some adjustment.
23. Excessive tone arm pivot friction in many samples. Replace arm with Formula 4.
24. Some acoustic feedback tendency at very high listening levels.
25. Integrated arm/turntable. Performance can be improved by replacing tone arm with one of Recommended arms.
27. Belt drive, low torque.
29. High-speed (7.5 & 15) model.
31. If unbalanced inputs cause hum, use input transformers.
32. Set-up adjustments accessible without removing cabinet.
33. Edit cueing not possible.
34. Built-in test oscillator: 1-kHz frequency.
35. Built-in test oscillator: 8- or 10-kHz frequency.
36. Digital (PCM).
37. PCM copy facility.
38. Unusually good s/n ratio.
39. 10-1/2-inch reel adaptors available at extra cost.
40. Awkward to thread.
41. Does not meter output signal.
42. Separate play head facilitates adjustment for specific recording tape.
43. Instructions describe user set-up for specific recording tape.
44. External microphone preamps required. Available from manufacturer.
45. Human engineering poor; controls not in logical locations.
46. Low output; needs pre-preampifier with many preamps.
47. Omnidirectional.
48. Cardioid.
49. Bidirectional (figure-8).
50. Emphasized presence range, rolled-off low end; ideal for speech or pop vocal.
51. Somewhat awkward to handle.
52. High output may overload some preamps.
53. Choice of AC or battery-powered supply.
67. Fairly low sensitivity.
68. Moderate sensitivity and selectivity.
69. Very highly sensitive and selective; ideal fringe-area tuner.

70. Tuner section better than audio section.
75. No auxiliary AC switching.
76. No tape monitoring provision.
77. Available in kit form.
78. No tone controls.
79. Low output voltage; will not drive most US-made power amplifiers to full output.

80. Outstanding record for dependability.
81. Volume compressor/expander can be used as tape-record noise-reduction system as well as for existing recordings.
82. Professional tape-noise-reduction system.
83. Poor tone-control action.
84. Needs high-impedance load; use only with tube-type amplifiers.

86. Flexible and effective control lineup.
87. Some hiss audible through high-efficiency speakers; use power amp with input level-set controls.
88. Unsurpassed reproduction of inner detail and depth perspective.
89. Integrated preamp/amplifier.

90. Includes built-in power amplifiers specifically matched to and equalized for the speakers and their radiation characteristics.
91. Floating 0-ohm output terminals; may not be usable with common-ground headphones or speaker-switching devices.
92. Best with electrostatic tweeters or tweeters with comparable transient performance.
93. Some samples may oscillate at full-up volume-control setting.
94. Best with typical dynamic tweeters.
95. Under-damps low end of many dynamic woofers.
96. Over-damps low end of many dynamic woofers.

98. Mono power amplifier.
99. Low power capacity.

100. Very high power capacity.
102. Very low efficiency.
103. Fairly low efficiency.
104. Fairly high efficiency.
105. Will produce very high listening levels with adequate power. Watch for hearing damage!
106. Does better with good solid-state amplifiers than with tube amplifiers.
107. Difficult load for most amplifiers.
108. Best driven by top-notch tube amplifiers.
109. Cross over above 2,500 Hz unless modified.

110. Must be biamplified.
111. Should be biamplified for best detail and control.
112. Best in very large listening rooms.
113. Ideal for small listening rooms.
114. May be biamplified for considerably higher efficiency and better control of driver balance.
115. Unusually critical of room placement.
116. Use Quad 303 power amp or one of similar power rating.
117. Beamy high end.
118. Unusually spacious sound.
119. Excellent stereo imaging.

120. Moderately good stereo imaging.
121. Very large apparent sound source.
122. Excellent driver blending.
123. Woofer does not blend well with upper range of system.
124. Some audible discontinuity between upper-range drivers.
125. Very comprehensive protection circuitry.
126. Slightly distant perspective ("Row M").
127. Neutral perspective ("Row H").
128. Rather forward perspective ("Row A").
129. Very "gutsy" and authoritarian sound.
130. Some vowel-like coloration.
131. Passive crossovers, available for use with Magneplanar and Quad systems, allow for common-bass (single-woofer) operation.
132. Tendency toward boomininess.
133. Some upper-bass drumminess.
134. Somewhat loose low end; needs high-powered amplifier with very high damping factor.
135. Lean, dry low end.
136. Extremely tight, well-defined bass.
137. Rich, fat low end.
138. Very deep bass range.
139. Somewhat limited deep-bass range.

140. Low end may be underdamped by some amplifiers, producing flaccid heaviness.
141. Low end may be overdamped by some amplifiers, producing excessively lean, dry bass.
146. Must be driven by power amplifier.
147. 2000 ohms (Hi-Z).
148. 200-600 ohms.
149. 4 to 8 ohms.

150. Electrostatic.
151. High rejection of outside sounds.
152. Moderate rejection of outside sounds.
153. Designed for minimal rejection of outside sounds.
154. Heavy weight.
155. Very lightweight.
156. Extreme highs slightly soft, sweet.
157. Airy, open high end.
158. Bright, very "alive" sound.
159. Slightly sizzly high end.

160. Somewhat hard over-all sound.
161. Slightly dry high end.
162. Slightly hard high end.

163. Crisp high end.
164. Wiry high end.
165. Extraordinary focus & "snap".
166. Unsurpassed high-end transient response.

177. Rather diffuse sound.
178. Somewhat deficient in snap and sheen.
179. Somewhat 2-dimensional sound; deficient in depth perspective.

180. Somewhat over-ripe, richer-than-life sound.
181. Liquidly transparent, lucid.
182. Slightly dark, heavy.
183. Slightly grainy over-all sound.
184. Slightly veiled.
185. Very subtly veiled.
186. Slightly dry sound.
187. Poor reliability record.
188. Despite any deficiencies, this is one of the most accurate sound reproducers in its component category.
189. Fantastic!

190. But is it worth the money to you?
191. We don't really like this but a lot of people whose judgement we respect do.
192. Our personal favorite, as of now.
193. We feel rather so-so about this. Better audition it before deciding.
194. A mixed bag. We like it but you may not.
195. Best performance for the money.
196. Failure rate not yet established.
197. Samples may vary widely.

* Discontinued model.
• Early version of Pro-Musica phonograph unit dropped from list. Current version not as yet tested.
• Shure V-15-IVG cartridge added to list in Class A.
• Advent 300 preamp (without power amps) superseded in Class C by Ace 3000.
• GAS Ampzilla II superseded in Class C by Bryston 4-B in Class B.
• Spendor BC-I speaker system added in Class B.
• Discontinued Revox A-77-III dropped from list. B-77 not yet tested.

SOURCES of Items Not Readily Available
M&K: 8719 Wilshire Blvd., Beverly Hills, CA 90211
Paoli: P.O.Box 876, Paoli, PA 19301
PML: Ercona Corp., 2492 Merrick Rd., Bellmore, NY 11710
Zerostat: Discwasher, Inc., 909 University Ave., Columbia, MO 65201
Decca: Rocelco, 160 Ronald Dr., Montreal, PQ, B4X 1M8, Canada
Linn-Sondek: Audiophile Systems, 5750 Rymark Ct., Indianapolis, IN 46250
KMAL: See Linn-Sondek
Nagra: 19 W. 44th St., Rm 715, New York, NY 10036
Stellavox, Hervig Electronics, 1508 Cotner Ave., Los Angeles, CA 90025
Beyer: Revox Corp., 155 Michael Dr., Syosset, NY 11791
Pro-Musica: 603A W. California, Urbana, IL 61801
Russound/FMP, Inc.: Mill Bldg., N. Berwick, ME 03906
Berning: Audionics, Inc., Suite 160, SW 5th Ave., Beaverton, OR 97005
B&W: Anglo-American Audio Co., Inc., P.O. Box 653, Buffalo, NY 14240
Conrad-Johnson Design, Inc: 1474 Pathfinder La., McLean, VA 22101
FMI: 4428 Zane Ave. N., Minneapolis, MN 55422

See also the brand listings for the dealers advertising in this issue.

Why Not?

If you subscribe to our views, why not subscribe to our magazine? Our gleanings from the grapevine indicate that there are still thousands of you out there who still borrow each issue from friends, and you you we say "Shame!" We do carry ads now, but subscriptions are still almost our entire source of support. Without that support -- and that means your support -- there will be no more Stereophiles to borrow or to buy. And consider how you would feel if your only sources of information about components and the high-end audio scene in general were the other audio magazines you now read? If that idea doesn't much appeal to you, then don't just sit there on your free-loading fanny; do your bit to help us continue doing what has earned us our reputation as the most reliable and most authoritative publication for audiophiles in the US. There's a subscription coupon on the next page for people who like to clip coupons. Or, if the owner of this copy won't let you chop it up, you can simply mail us a check for the proper amount along with a card indicating whether you wish your subscription to start with the current issue or the next.
Preamplifier Update

Our continuing evaluation of available preamplifiers has not as yet turned up anything we could hold up as the State-of-the-Art-preamp.

The three best we've found thus far, though, are the Hafler DH-101, the un-numbered Conrad-Johnson and the Audionics BT-2.

Briefly, they may be characterized as follows:

Hafler: Extremely accurate RIAA equalization, excellent depth and definition, very low noise, very subtly dry sound, subtle high-end edge. The most accurate and flexible preamplifier for the money, and one of the most accurate and flexible at any price.

Conrad-Johnson: The best we have found for use with electrostatic speakers or systems having electrostatic high ends. Very accurate RIAA equalization, very tight, deep bottom -- better than a stock Audio Research SP-3A-1, very good inner detail and definition, liquidly transparent, excellent depth and a fairly open but extremely natural high end with unsurpassed (to date) reproduction of the highest musical overtones. (Strictly speaking, we have heard a preamplifier that did better on overtone naturalness as well as on everything else: The Zeligman/Berning unit which exists only as a prototype at present. Production has been, we are sorry to say, postponed indefinitely.) The C-J is not quite as "alive" as the Z/B, nor even quite as much so as the discontinued Audio Research SP-3A-1, but it is nonetheless an ideal preamp for electrostatic high ends (with all tubes in between). It is not "fast" enough to offset the relative slowness of dynamic speakers.

Audionics: RIAA equalization very gradually tapered downwards towards high end; slightly warm, rich sound, very transparent, no graininess or dryness, and an open, airy high end with unusually natural reproduction of highest musical overtones.

Another "best buy" that must now be added to the list, with
qualifications, is the Ace Audio Model 3000 "pancake" preamp at around $50 less than the ready-built Hafler. Its equalization is shelved at around 1 kHz, with the range below about 2 dB below the range above, yielding a rather lean, somewhat forward sound. Highs are extremely smooth and musical -- comparable to that of the Conrad-Johnson, and over-all sound is a shade on the dry side. Highs are slightly "easier" than those of the Hafler.

Choose the solid-state preamp whose RIAA equalization best complements the balance or colorations of the rest of your system.

Still to be tested: The Rappaport (after warmup), the Paragon 12A, the Audio Research SP-6, the super-preamp from Crown, and a unit from a new firm called Spatial.

Scuttlebut

The grapevine has been feeding us pre-test and follow-up information on more components. To wit:

The Electro-Research amplifier has "no solid-state texture but a rather bland, antiseptic sound."

The Audio Research D-350 is not quite the equal of the defunct D-150 in mid-range liquidity, but is more detailed and airier at the top and fuller at the bottom, with a slight mid-bass heavity. The new D-110 is being reported as superior to the D-350.

Earwitnesses report a virtual dead heat between the Audio Research SP-6 ($1100) and Spatial ($1200) preamps.

Except for the usual prejudiced reaction of another "undergrounder," the Shure V-15-IV has been earning raves to date.

Some dealers claim the Mayware Formula 4 arm falls apart in use. Have any owners experienced this? Let's hear from you about this.

Most of our informants now rate the ARC-D110 above both the Electro-Research and the Threshold amps.

The Spendor speakers reported on in this issue are the current model, but they are not called BC-1As (as they were in another magazine). Those are special-model BC-Is with their own built-in power amplifiers.
A TRIBUTE TO ETHEL WATERS. Diahann Carroll with the Duke Ellington Orchestra, directed by Mercer Ellington. Orinda ORC 400.

This limited edition disc utilizes the Soundstream digital recording system. Once again the clarity and quality of the record were superior. Digital methods tend to make the conventional analog methods of recording sound veiled. Unfortunately, there is a slight harshness in the brightness range (Probably the mikes). Also, Miss Carroll is too close to her mike, a common failing amongst pop singers. There is a sibilant sizzle which could have been avoided. Her interpretations are excellent, and the back-up provided by Mercer Ellington and his father's orchestra is elegant. This is a good record, not only for its technical excellence, but its musical value. MG

CHECK UP YOUR SOUNDS, Vol. 1


This is a fascinating disc. To begin with, the recording is quite simply stunning. It is not a direct-to-disc effort, but if I were involved in direct-to-disc recording, I would take a long, hard listen to this before committing myself to too many future D-to-D jobs. This has the most lucid, alive instrumental sounds on it I have heard from a disc, and it has every bit the transient response of a good D-to-D job. It wasn't even cut at \( \frac{1}{2} \) speed, like Mobile Fidelity's remarkable (sonically, not musically) discs! In fact, while it equals Sheffield's Los Angeles Philharmonic discs in transparency and snap, it betters them by a substantial margin in terms of high-end naturalness. The Sheffields are a bit hard and steely; these are simply natural, with the best massed-violin (albeit very close-up) sound I have yet to hear from a disc -- thanks to string pickups via Schoeps microphones (with tube electronics), and a vacuum-tube cutting amplifier. (Sheffield, by the way, is now said to be considering going entirely tubed, from mike to cutter amp. Who said tubes are dead? I think Dynaco and Audio Research have goofed in abandoning tubes at this particular time.)

The Audio Symphony, by Koichi Sugiyama, is modern but not aggressively so -- not modern enough to repel reactionaries like myself who feel that serious composition died when Copeland sold out to the 12-toners. There is even a short segment of pseudo-rock, with a full string section (!?). The perspective is very close -- much what the conductor himself would hear, and thus must be listened to at rather high levels (around 102 dB max) in order to sound right. The sound is analytical and almost frighteningly real, yet it has the warmth of live music and a nice sense of the acoustical environment. It's an audiophile's dream: Sweet strings, razor-sharp percussion, hair-raising brasses, extraordinarily tight, solid low end.

The symphony is short, and the side is filled out by a hauntingly lovely song by a young Japan-
ese lady (singing her native tongue), backed up by a small combo including some of the sweetest-sounding violins this side of Jackie Gleason.

Side 2 comprises 10 short selections by various different instruments, including some oriental ones unfamiliar to occidental ears. All of the cuts demonstrate the difference between recording in a dead studio and in the natural reverb of an auditorium. All are closely-miked, all are very clean and very realistic, but as far as a means of "testing your system," all require that the listener know what the original unamplified instruments are supposed to sound like before he can even begin to assess his system with them. ("Sounds good to me" isn't good enough. When was the last time you heard live, unamplified instruments?) Side 2, then, will be rather academic for most audiophiles.

Side 1, though, is well worth the cost of this disc. I predict that the rock segment of the Symphony will be blaring from every booth at the next few audio shows -- every booth, that is, that isn't playing the rest of the side along with Japanese RCA's Appassionata (RDC-4) and the bass-drum section of Sheffield's Prokofiev disc (SL-8).


The title piece, Cousins, was composed about 1904 by Herbert L. Clarke and is a dazzling display of period Americana for cornet and trombone duet. Nonesuch's reproduction is excellent, with a crisp, clean brass sound. The piano balance is good, but a trifle percussive. Arthur Pryor (1870-1942) is represented by three of his legendary trombone solos, the most familiar being Blue Bells of Scotland. It's a fun piece, and Barron pulls it off with aplomb. Four additional artists join our stars for three excerpts from Henry Fillmore's 12-piece collection, Trombone Family, a humorous feature with some "Smears" reminiscent of the 1920's, jazz and ragtime. The pressing this time was fairly decent. Robert Offergeld's informative notes add considerably to Nonesuch's careful production.


The Vivaldi ensemble, so atrociously recorded on Japanese RCA, sounds here more like what I would expect to hear from those instruments.

The arrangements are sheer Japanese Mantovani! I do hope this reflects but one facet of current Japanese popular music, for while they are superb technicians, their culture seems in most instances to mitigate against a complete assimilation of Western music. (An exception is Ikuyo Kamika's "Appassionata" on Japanese RCA.) These works are immediately accessible to Western ears, the melodies disarmingly simple. But while this simplicity works with simple arrangements, as in the Rampal disc reviewed in these pages, it merely sounds overblown when subjected to such lush arrangements as these. The effect is, rather, somewhat akin to serving graham crackers with Bavarian cream topping.

Nonetheless, the sound here is nothing short of sumptuous and, as such, I can recommend the disc for sheer aural hedonism if not for weight of substance.

Denon's policy of including no jacket notes is particularly irksome here, where none of the music is familiar. But since many of the pieces are duplicated on the Rampal record, which does have detailed jacket notes, owners of
that disc can use its jacket notes to shed some light on much of the material on this Denon disc. MG

THE BEST OF SPIKE JONES (and His City Slickers). RCA ANL-1-1305(e).

Remember Spike Jones? If you're old enough to remember radio in the 1940s, you'll remember him and you'll probably want this record. If you aren't, and don't, you may still want this collection of musical madness which did to pop tunes what P.D.Q. Schickele is doing to the classics.

Those of us who owned a few Spike Jones discs never knew how good the recordings of that era really were. We listened to 78-rpm surfaces, that overlaid the sound with a grayish fog and turned liquid textures to grit. This re-release of most of the old SJ favorites ("Bubble Gum" and "Leave the Dishes in the Sink, Ma." are missing) is a revelation. Those old 78-rpm recordings were a damn-sight better than anyone of us would have guessed. The sound is crystalline, limpidly transparent, and remarkably wide-range, with dead-quiet surfaces. How was it done? With noise reduction? Nope. Producer Don Miller had access to the metal stampers, and they were used to make vinyl pressings, which were then dubbed onto tape for the transfer to 33-1/3. Even the fake stereo is, for once, done tastefully and convincingly.

The humor is sophohmoric slapstick laced with gleeful vulgarity. There is nothing cerebral about it, unlike Schickele's PDQ Bach revelations (which require of its listeners a certain degree of musical savviness). But if you enjoy hearing someone thumbing his nose at musical conventions, pop and otherwise, get this whether or not it also spells Nostalgia for you. (The 40's weren't really all that dandy anyway; we had Der Fuhrer and Ration Coupons and Telegrams of Regret from the President. But we also had Spike Jones, who helped to make the other things tolerable.)

Now, why can't RCA do this kind of thing with some of their classical archives of music never-since-recorded or never-since-performed-so-well? JGH


This is an excellent performance of the ballet score. The tempi are suited to the dance, and the dynamics and inner drive are pleasing. For lovers of the concert suites derived from this music, the pace will seem somewhat relaxed, and perhaps not forceful enough. For those who love the ballet, this performance will be eminently satisfying. Having refreshed my visual memory by watching the American Ballet Theatre on PBS, listening to this record evoked every gesture and motion of the dancers. For me this is a definitive performance, but it may not please those who are not balletomanos. I am on the horns of a dilemma here. Which do our readers prefer: ballet theatre or concert hall renditions? Feedback, please.

As with all Enigma recordings, the mikes are at a fair distance and the integrity of the orchestra and conductor's balances are preserved through lack of diddling with the sound. I am always delighted when a recording reproduces the musicians' intentions. I think you may have guessed by now that I really enjoyed this recording.

At this time, Enigma recordings are not generally available in the US. They can be ordered, however, from an excellent record service: Andre Perreault, The Old Stone House, Winooski, VT, 05404. His catalogue costs $2.00 plus 75¢ for mailing charges. In return, one receives a volume of 762 pages and monthly supplements listing new releases. As this firm is Canadian-
Audio Technica's Superdiscs

Direkt-to-Disk Records, a division of Sonic Arts Corp., 665 Harrison St., San Francisco, CA

RUSSELL STEPLAN. PIANO FIREWORKS! Chopin; Fantasie Impromptu in C# Minor, The Polonaise in A Flat Major. (2 discs) #01

DAVID MONTGOMERY, "THE PIANO", Weber; Waltz in E Flat, Beethoven; Four Country Dances, Brahms; Five Walzes from Opus 39, Schubert; Twelve Landler, Opus 171, Godowsky; Alt Wein. #02

DAVID MONTGOMERY. Piano Pieces by Schumann, Liszt and Chopin. (Binaural Recording) #05

DAVID MONTGOMERY AND CECIL LYTLE: PIANO RAGS. Ragtime Piano for Four Hands. #06

WOOFERS, TWEETERS AND ALL THAT JAZZ. Assorted Musicians. (Binaural Recording) #07

UMBRELLA RECORDS, a division of Nimbus 9 Productions, Ltd. Toronto, Canada.

BIG BAND JAZZ. Rob McConnell and the Boss Brass. (2 discs) UMB 4

TORONTO CHAMBER ORCHESTRA Conducted by Boyd Neel. Mozart; Eine Kleine Nachtmusik and Divertimento #11 in D Major. UMB DD6

BIG BAND JAZZ, VOLUME TWO. Humber College Jazz Ensemble On The Way To The Montreux Jazz Festival. UMB DD7

CANADIAN BRASS. UMB DD5

TORONTO CHAMBER ORCHESTRA Conducted by Boyd Neel, Volume Two. Steven Staryk, violin: J.S. Bach; Concerto for violin, String orchestra and continuo in E Major, and ar-

rangements of shorter works. UMB DD9

RCA JAPAN. DIRECT-TO-DISC SERIES. RVC Corp., Tokyo, Japan.


TRACKIN'. Lew Tabackin. RDC-3

WARREN SMITH & TOKI. DUOLOGUE and HERITAGE. Drums and Saxophone. RVL-8501

WARREN SMITH & MASAMI NAKAGAWA. Percussion and Flute. RVL-8502

TELARC RECORDS, a product of ADVENT RECORDING CORP. OF OHIO, 4150 Mayfield Rd., Cleveland, OH 44121

MICHAEL MURRAY PLAYING THE GREAT ORGAN IN THE METHUEN MEMORIAL MUSIC HALL, VOLUME I. (Direct to Disc) DD-2

Due to an interest generated by Stereophile and abetted by other underground publications, Audio-Technica has seen fit to distribute a number of audiophile recordings. With so many to compare, we are now learning that direct-to-disc recording technique is not sufficient unto itself. Not only is poor microphone technique laid bare, but differences in cutting amplifiers, mixers, microphones, etc. can be heard. Too, the performances are not always what they should be. In the last issue we reviewed a few of these. We are now giving you a rundown on a lot more.

The worst of the lot, technically, but also one of the most in-
Interesting is Direkt-to-Disk's Piano Fireworks. Each of three sides reveals how different mike placement and room treatment will affect the sound of a piano recording. The fourth side is the pressing of the taped version. Unfortunately several sides of the D-D are marred by some sort of noise reminiscent of tape hiss, a patent impossibility. The listener deserves either an explanation in the jacket notes (which isn't there) or a properly made recording. Stepans performances were adequate, but like all the piano recordings made by Sonic Arts' Direkt-to-Disk division, they left me somewhat cold. There seems to be a tendency lately for pianists to have either bombast or a lovely touch. Somehow the ability to link a good and varied tone to expressive dynamics seems lacking in many pianists committed to disc. This is not exclusive to direct to disc recordings, either.

David Montgomery has a nice touch which I would like to see him exploit in music by Debussy and Ravel rather than the Romantic composers he seems to favor. In his record "The Piano", he plays some lovely "lollipops" but the performances are on the dull side. Even in his binaural recording I feel as if he's holding back. The binaural recording is of interest but not successful. On side one a listener's perspective was employed. Mr Montgomery felt that he preferred a performer's perspective, and side 2 was recorded that way. Unfortunately, it does not yield a performer's perspective in playback, to the current limitations of binaural reproduction. A pianist hears most of the sound from in front. No binaural recording, including this one, has managed to put the sounds there; they are either at the sides or inside the listener's head.

The most successful recording is the "Piano Rags". This is delightful music, well arranged with excellent jacket notes. I recommend this heartily.

To return to binaural sound, "Woofers, Tweeters and all that Jazz" works better than Montgomery's recording. There is still no frontonal localization, but the placement of several instruments in various other locations is at least believable. There is an uncannily realistic feeling here of being right in the midst of the players as they move about the room (and many do move during the performances). And it helps to read the jacket notes on this for clues as to what is going on. Besides the musical instruments, there are embellishments with sound effects -- bird calls, rain, etc., which end up sounding somehow more realistic than the musical elements of the program.

Oddly, both this and the Stepans had what sounded like some tape hiss but obviously could not have been. Noisy mike preamps, perhaps? It makes one wonder how much of the noise on conventional recordings was in fact from the tape.

My first reaction to Umbrella's Mozart release was, Good grief, not another Eine Kleine...!!! Under Dr. Neel's direction, however, listening to this became a delight rather than a tedious chore. The incisive and superb performance make this a "must-have" in my record collection, but audio perfectionists of the musical variety will be put off by the steely strings and over-miking which Umbrella seems to favor in their sound. Much of the steeliness can probably be blamed on the mikes -- that "German sound!" again. AKGs and Neumanns do not seem to handle strings well. And the choice of ribbon mikes for the harpsichord was unwise; they lack the transient response necessary to reproduce the delicate attack transients of the harpsichord's quill-plucked strings.

These records would be instructive for anyone considering the purchase of microphones because the recordings themselves display the mike characteristics so clearly. But I wish Umbrella would try a more-distant pickup, maybe even with a single mike pair. I think Dr. Neel
and his superb chamber orchestra would sound extraordinary.

Both "Big Band" records released by Umbrella were enjoyable. I especially liked the Rob McConnell. The steeliness is not so bothersome here, and there is a wonderful sound to the brasses. The performances and arrangements are mature and exciting. Guido Basso on the flugelhorn should not be missed. Buy this one! The Humber College group is a larger ensemble. Despite their youth, the performances are excellent and exciting.

A totally different brass sound is exhibited in "Canadian Brass". This is a classical group whose program ranges from Bach through folk tunes to Dixieland. A good choice for the audiophiles, as it is eminently satisfying in its reproduction of these fulsome instruments.

I only wish I could be as kind to RCA Japan. Their recording of the Vivaldi Ensemble is atrocious! Avoid it. Even with sympathetic understanding of the Japanese love for transients and its resulting tendency to mike too closely, I found this unbearable. The sound is of steel violins in a platinum room, and gives no hint that all the instruments are of "distinguished" Italian origin, including two Guarneriers. Denon's PCM recording of this group (Page 41) is a much more faithful and satisfying reproduction of their sound, which says something significant about D-to-D recording.

RCA Japan does better with "Trackin", although one is sitting on top of the band, not even next to it. And something is lacking in the sound. Flute overtones were missing in "Summertime", for example. Despite these cavils, this would be a good show-off record for anyone not familiar with the natural sound of the instruments. The other two RCA discs display the same formidable miking technique. I am not at all conversant with this school of improvisation which apparently derived from jazz and produced John Cage, Elliott Carter, etc., so I will not comment on the performances. Try to hear part of one before you buy them, to see if its your cup of tea.

The Michael Murray recording which Mr. Marsh will be reviewing in more detail is a must for audiophiles. I do prefer, however, the organ recording entitled "Concert." (See below)

I have the feeling that audiophiles prefer larger-than-life recordings. For this reason discs featuring solo instruments or small chamber groups lack a universal appeal. The one exception is pipe organ, which reproduces many timbres and is capable of the deepest bass of any instrument. Thus the fact that this recording is of first-rate music, played well and lovingly recorded, will matter less to many of our readers than the fact that it has some extremely deep bass on Side 2. My snide remarks aside, those of you who enjoy music -- buy this, and those of you who are "bassophiles" -- buy it too!

For those people who have a system capable of reproducing very deep bass, there is a nice demon-
stratification of eigenmode reinforcement in the Puxtehude selection. The sustained 32-Hz pedal notes are suddenly reinforced by the reflect-ed sound, but slightly lower in frequency.

The two organs were recorded with different techniques. For the Flentrop, crossed bi-directional microphones were used at an approximate distance of 10 feet. For the larger Holtkamp organ at the Air Force Academy, two omnidirectional mikes were deployed at a distance of about 25 feet away. Other details, including the dispositions of the organs, are given on the record jacket.

This has to be one of the best organ recordings I have heard -- not as high-powered as Virgil Fox's sonic tour de force for Crystal Clear, but of far greater musical substance.

FOR DUKE. (Works by Duke Ellington)
Bill Berry and His Ellington All-Stars. Bill Berry, cornet; Ray Brown, bass; Frankie Capp, drums; Scott Hamilton, tenor sax; Nat Pierce, piano; Marshal Royal, alto sax; Britt Woodman, trombone. 1/2 & K Real-Time (d-to-d) RT-101. $14.00 postpaid from Miller and Kreisel Sound Corp., 8719 Wilshire Blvd., Beverly Hills, CA 90211

This is to-date the best direct-to-disc recording I have heard. For once I can't complain about the high end being shrill or hard, the balances are excellent, the performances superior with each member of the group getting his chance to show off. Marshal Royal's saxophone solos must be heard to be believed. Everyone present is obviously having a good time making music, which is the way it always ought to be but often isn't.

The highs on this disc are extraordinary -- nothing like what I have come to think of as the German-microphone sound (hard and sizzly). Yet the mikes used were in fact German AKGs and Neumanns; the difference is that they were extensive-ly modified by M&K's Ken Kreisel, who is to be congratulated for the success of his efforts.

I am most pleased to report that this superb disc is but a taste of things to come: Scheduled for release by M & K in the near future are recordings of Earl "Fatha" Hines, Ed Graham, a percussionist, a Flamenco show with a rousing contest between drummer and dancers, and most exciting, Beethoven's Ninth Symphony will be recorded early in July. We look forward to auditioning all these releases as soon as possible and give M & K top marks for building an exciting and diverse catalog.

Editor's Addend: Everyone making perfectionist-oriented discs ought to take a long, open-minded listen to this. The high end is as open and natural as anything yet committed to disc; the cymbals sound real. And the other instruments -- even those which are a bit too close to the nearest mike -- have a natural-ness of timbre and formant structure that has rarely been equalled and never to date surpassed.


The massed-string sound in this is much better than in the Janacek (Pg. 47), perhaps because there are fewer of them? Although there is a slightly hard sound, and some lack of air, instrumental timbres are largely right and the transients are good. The miking technique in these denon records seems good. Although there is little hall sense, the balances are excellent. The harpsichord, for once, serves its continuo purpose, audible but not too audible. In fact, the balances and the clarity of the recording make it excellent for listening to separate lines of music. Although I have heard very few PCM recordings to date, this remarkable inner clarity and detail has been
an unheralded bonus with practically every one I have auditioned. Try picking out the harpsichord, or any single instrument, in any of these works. Just as at a concert, one is able to do this from the record. A good recommendation!

I especially enjoyed the Concerto in B-flat Major for treble recorder, oboe, strings and basso continuo. The little duets between the recorder and oboe are charming. Try to buy this; it's worthwhile.


This is an extraordinary record. In the first place, it is a superb recording of flute and harp -- so liquidly transparent in fact that it could well have been digitally mastered. Secondly, the music is totally beguiling. The arrangements are very low-key, soft, wistful and somewhat nostalgic in nature. The first time I heard this, I melted.

Many of these folk songs are to be found on the Denon PCM disc of the Vivaldi Ensemble reviewed elsewhere in this issue. Also, there are descriptive notes about those works on the Columbia sleeve -- the Denon provides no program information at all. Mr. Yashiro's arrangements are completely oriental in flavor, and Rampal uses an oriental approach to his instrument, in contrast to the Western approach of the Tokyo Vivaldi Ensemble.

This is not a show-off disc, but it belongs in your collection if you occasionally enjoy just sitting back to listen for pleasure (rather than critical system analysis), and don't feel in the mood for sturm und drang.


I am especially fond of Janacek so I looked forward to hearing this disc. As I listen to more and more PCM-mastered recordings, I become increasingly aware of their almost-incredible transient response -- not the exaggerated detail of overly-close miking, but a natural "snap" that delineates the primarily transient nature of actual musical sounds. In this respect, PCM discs are indistinguishable from direct-to-disc recordings. But PCM may have its own unique forms of distortion which are unfamiliar to ears grown accustomed to conventional taped masters.

**PCM Recording**

For the benefit of readers who are encountering this term for the first time, PCM stands for pulse-code-modulation, which is a form of digital audio recording. In PCM recording, the continuous energy fluctuations of the audio signal are converted into a series of impulses each of which represents the On position of a switch. Energy fluctuations are conveyed as variations in either the duration or the repetition rate of the pulses. In theory at least, PCM eliminates all the noise and distortion problems of conventional (analog) recording.

To date, all available PCM recordings have been PCM-mastered, to produce conventional disc recordings. Several hardware manufacturers are however planning to make available soon the necessary players to reproduce directly from PCM discs or tapes in the home.
In this disc, the massed-violin sound seems lacking in the proper delicate resinous sheen; the sound is lacking air. There is also somewhat of a veil over the violin sound that masks the shimmering effect which Janacek conceived. Brasses however are impressive, especially in the Sinfonietta. Solo instruments, even violins, fare well. And in Taras Bulba, the string and organ duets are lovely. Both works are excellently performed. Tempi are neither rushed nor hesitant, but at times the ensemble sounded less than tight. Nonetheless, this is a worthwhile purchase, for both its sound and its interpretation. MG

Editor's Addend: I don't care for the swimmingly reverberant hall this was recorded in. Otherwise I concur with Ms. Graham down the line. JGH

Sheffield/LA Production

We received our first production pressings of the Sheffield direct-to-disc recordings of the L. A. Philharmonic/Leinsdorf recordings reviewed in our last issue from test pressings. The production ones were, surprisingly, even hotter at the high end than the test pressings -- not substantially, but enough to be heard without a direct comparison with the first pressings. (A direct comparison merely confirmed it.)

These pressings were from the same disc-cutter that made the test pressings. That at least would seem to be the case, as the matrix numbers (on the vinyl, next to the label) were the same. So we could only conclude that there must have been a difference in the vinyl used to make the test pressings and the production pressings.

Subsequently, we got confirmation that it probably was a difference in the vinyl. Sheffield's Doug Sax sent us, for comment, a sample pressing made with the special vinyl that was formulated for RCA's CD-4 quad discs. It was the best pressing of the three we had heard, with the smoothest, airiest, most natural top of the three. A simple but probably valid test indicated that there were in fact three different vinyls involved. We drilled three holes in a board and stood three identical ball-point pens in them, pointed end up. Each disc was placed over the end of a pen, and we then used a wooden pencil to tap the outer edge of each disc, listening to the sound they made. All three were different, in ways suggesting differences both in hardness and in resonance-damping. There is no point in our trying to explain here what the differences were, as a buyer would have no way of comparing what he heard from this test unless he had two pressings on different vinyls to compare one with the other (or a frequency counter to get a readout on fundamental ringing frequency).

Anyway, we hope Sheffield can see their way clear to use the CD-4 vinyl, as it was obviously the best of the three. Putting this in perspective, though, we still feel that the "worst" of the samples we heard represents a landmark recording, combining superb performances with the most stunning, high-powered recording of a symphony orchestra yet to be made. (RCA Japan's "Audio Symphony" -- RVL-1 -- is equally high-powered with a rather sweeter top than the "hot" Sheffield pressing, but the miking produces a most unnatural representation of an orchestra, and you may not care much for the music.) JGH

(Mr. Sax has since informed us that the CD-4 vinyl sounds sweeter on some cartridges and harder on others, and is in short supply anyway. He also feels though that it is the preferred vinyl, and plans to start using it for pressings when and if it becomes available.)
DB Systems DB-6 Amplifier

The LEDs are true peak-clipping indicators -- a half-cycle of clipping at 20 kHz is sufficient to give a clearly visible indication. On some amplifiers, the lights do not indicate clipping until the amplifier is being heavily over-driven. The amplifier is also available as a bridged mono unit, the DB-6M, for the same sonic performance at 140 watts into 8 ohms and 225 watts into 4 ohms.

David B. Hadaway
DB Systems

Reviewer's Addendum: We intend to test a pair of DB-6Ms; the higher power would almost certainly overcome our objections to the DB-6, and the result could well be worth the high cost.

Audio Perfection Cables

Thanks for the nice albeit brief report.

You should know however that we are no longer selling our cables to FMI for resale. His present audio cables are being made by someone else and I do not know whether or not they are electrically identical to ours.

Mark Balkowitz
Audio Perfection

Polk Cobra Cables

Our investigation of the instability problem with some amplifiers revealed that capacitance alone was not the problem; it was the cable capacitance plus the tendency for the impedance of dynamic tweeters to increase at a rapid rate above the audio range.

We have now devised an interface module which, when fitted to the speaker end of each cable, seems to eliminate the instability problem. All of our cables are now fitted with these simple devices. The module has no effect on the performance of the cables, except insofar as it improves the sound of those amplifiers which were marginally unstable but did not actually oscillate with the original cables.

Mat Polk
Polk Audio

Reviewer's Addendum: Okay, so our diagnosis of the instability problem was only half right. We tried the new cables with their "interface module," and had no trouble with any of the amplifier/speaker combinations that were bothered by the original cables. Reports from the field are tending to confirm that the instability problem has been licked. So we now recommend these as the speaker cables of choice for the perfectionist, and a damned good investment for the person who is seeking better high-end response for less than the cost of a new power amplifier or speaker system.

A final, cautionary note: Since these cables will audibly increase the amount of high-frequency energy from most systems, with the increase extending as far down into the spectrum as 7 kHz in some instances (such as when the amp-to-speaker distance is 35 feet or more), the "improvement" can actually degrade the sound of systems which already have natural-sounding highs with the cables you are now using. A case in point was an Audio Research Dual-150 power amplifier and Spendor BC-1 speakers with FMI Gold cables in between, which yielded precisely the right amount of high end. (The D-150 has the typical tube sweetness at the top, while the Spendors have a slight 12-kHz peak.)
Substituting the Cobras made the over-all sound irritatingly hard and brittle.

We would thus be inclined to recommend the Cobras unreservedly only if you feel your present system to be deficient in snap and airiness.

If you have some technical savvy you may wonder if, perhaps, the Cobras weren't inducing oscillation or, at least, severe ringing in the D-150, which might account for the hot top. We verified with a 'scope and square waves that it was not.

And finally, a question: We did not have any electrostatic speakers on hand to see how the Cobras would work with them. We would appreciate hearing from any readers who have tried that combination, and would appreciate even more some 'scope photos of 10-kHz square waves at the amplifier outputs and at the speaker. JGH

Unrecommended Components.

For the benefit of readers who wish a better perspective for judging our "Recommended Components" listing, we present the following almost-complete listing of components that we have auditioned, formally or otherwise, but which never made it to the "Recommended" lists, usually because they were judged to be no better, on the whole, than many others in their price class. Thus, "Unrecommended" in this context does not necessarily mean we advise against purchasing these items, but merely that we cannot single them out as being that much better than their competition to warrant a Stereophile recommendation. Designs which we feel to be intrinsically faulty are identified in the Unrecommended listings by an asterisk, which is not to be confused with a Recommended asterisk which means a discontinued product.

The items are listed here in purely random order. They will be categorized for easier reference next time the listing appears -- probably in the next issue.

- Dynavector DV-505 tone arm*
- CM-612A preamp
- Frankman speaker
- Luxman 3045 power amp
- Dynaco Mk VI power amp
- E-V Sentry III speaker
- Sonus Blue cartridge
- Magnepan speaker
- DCM Time Window speaker
- DB 1 preamp
- Power Research System III-E, System IV speakers
- Beveridge 25W speaker
- M Fried B speaker
- Analogue 520 preamp
- Denon D-103 cartridge
- AKG P8-ES cartridge
- Win cartridge
- ADC ZLM & XLM cartridges
- Decca Mk 6 Gold cartridge
- Loudspeaker Design "Ezekiel" speaker
- Entre 1 cartridge
- Supex SD-900 cartridge
- Grado GI+ cartridge
- Infinity QLS speaker
- Dahlquist DO-10 speaker
- Bose 901E speaker*
- BGW 410 amplifier
- McIntosh MC-2200 amplifier
- Infinity QRS speaker system
- Naim NAP-120 amplifier
- Phase-Linear 4000 amplifier
- Technics SP-10 turntable
- Sony TA-8650 amplifier
- BGW 203 preamp
- Harman-Kardon 16 amplifier
- Phase-Linear 4000 preamp
- Pioneer PL-570 turntable
- Transcriptor turntable*
- AKG 140 headphones
- Superex PEP-81 headphones
- JBL L-300 speaker
- Klipsch Klipschorn speaker
- Magnepan MG-III speaker
- FMI Nuance I speaker
- Wharfedale*E-70 speaker
- Kenwood KA-7100 amplifier
- ESS AMT-1B speaker
- Promethean cartridge
rectional speaker is that it is capable of exciting room resonances in only one mode; the other two are essentially untouched. The effect this has on clarity is remarkable, and is easily demonstrated when compared to identical speakers but with curved front surfaces.

I bring up this directionality situation because I have not heard conventional dynamic, wide-dispersion speakers in my room. My ESLs seem to have no difference in frequency response or clarity in any room or room position I have used them in, so long as they are kept at least 2 feet from the rear wall. I note that a number of other dipole radiators are very touchy about room placement, and suspect that this is because they are operated into the bass region. At any rate, these are not so affected, and the room didn't make much difference with regard to frequency response or resolution. I would expect that more-conventional, wide-dispersion speakers would sound clearer. This is not to say that I heard no differences in the highs. I did, but am at a total loss to explain it: The sound image was quite different. Specifically it changed from coming through the speakers to existing in space.

There is just no impression at all that the speakers have anything to do with the sound. Even though I know they are the source of the sound -- and that is usually enough to give me a mental set that the sound is coming from the speakers -- they now seem to be totally silent; the sound is between them, and extends very three-dimensionally to well beyond the wall (depending on source material). The imaging and dimensionality are so precise that on master tapes it is obvious that "the flute is 3 feet to the left and 10 feet in front of the trumpet". All I can say is that I did not hear this kind of imaging precision in any other room I have had the system in! And the quietness of the room adds a great deal of pleasure to the sound.

The differences I noted in the new room were vastly more dramatic than any ever experienced when switching from one super amp to another, or switching to different top-of-the-line speakers or pre-amps. There is no question, in my mind, that components cannot compensate for the effects of bad room acoustics, no matter how good they are. Devices such as Altec's AcoustaVoicing system do help, but they only correct for one listening location in the room, and they can only control rather gross bands of frequency problems. It is better not to have the problems to begin with.

The techniques I used were practical and relatively inexpensive and they work well. It is quite possible that my room could be further improved and those who know no limits are encouraged to try non-parallel walls and masonry construction. But no matter how far you go, you are virtually certain to achieve good results if the basic information outlined above is applied to your design.

Erratum: Several readers wrote to point out that the 525 figure used to calculate standing-wave resonances in Part 1 of Mr. Sanders' article should have been 565. We regret the error (it was ours, not Mr. Sanders'), but point out that it makes a difference of no more than a few Hz in the calculations and is hence not a disastrous error. Those who wish to be sticky about it are advised to recompute the figures given using the 565 figure. JGH

Moving?

When sending us your address-change notification, please include both your previous address and previous zip code. If we can't find your old address card, we have no evidence that you're a paid-up subscriber.
Good Timing in DC

While we were all busy diddling with our equipment and reading about the newest components in the underground press, our legislators in Washington pulled what looks very much from here like a fast one on us. You may recall from past issues our concern about some pending legislation that would empower the FCC to prohibit the sale of audio components which lack "adequate" filtering to suppress RF interference. (And the FCC would determine what is "adequate.") Well, the first hearing in connection with those bills was held on -- would you believe? -- June 14, right in the middle of CES week, when the people most likely to be affected by that legislation were touting their wares in Chicago.

A coincidence perhaps, but on the other hand, what better time could there have been to take up a matter that could spell disaster for the high-end audio field? As it turned out, our side of the story was aired at the hearing, thanks to Jack Hannold who managed to persuade the IHF to send a representative, and who testified himself on Stereophile's behalf. As things stand now, there will be another informal discussion of the legislation with Sen. Barry Goldwater (who introduced the bill in the Senate) late this summer, and this time, audiophiles will be represented both by Mr. Hannold and by JGH.

In case you didn't know, Sen. Goldwater is a radio amateur, not a CBer. He is also an audiophile. So common sense may yet triumph.

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The Imagogram

That's pronounced "imijigram," and it sounds like a photo sent by Western Union but it isn't. It's a new preamplifier whose designer claims capable of doing everything but reproducing the B.O. of the musicians! It may even turn out to be quite good (We'll try to get one for testing), but we have to say that the literature we received about it will probably stand for some time to come as a model for prolix, obfuscatory jargonism. We quote: "Primarily, the playback system supplies the outer ear function equivalent for each image angle in the recording while theoretically placing the listener in the position of the recording microphones." If we re-read this several times, we find it can be translated as follows: "The reproduction presents to the ears the directional information they would receive if they were located where the microphones were."

We must say, after plowing through 10 pages of that sort of thing, that we ended up with a lurking suspicion that this is another one of those devilishly-ingenious signal-processing devices like the Aphex "enhancer" that is the current darling of creative recording engineers. But, we'll look into it anyway. Why not?

Absolute Phase

A couple of issues back, we asked our readers to try listening to some discs with and without the connections to both their speakers reversed, to see if phase reversal of both speakers at once had any effect on the sound. We had found that it did indeed, but wanted to know how many of you heard the same thing. All of six people responded, and all six said they did indeed hear a difference although four were undecided as to which was "better."

More-recent communications with a Canadian gentleman, Stanley Lip-
shitz, turned up the fact that he
had hed been doing some interesting
experiments along these lines, de-
tails of which we won' t go into here.
Suffice it to say that he proved
to his own satisfaction, as well as
the satisfaction of others who
heard his tests, that a system must
be phased with the original sound-
pressure waves in order to sound
most natural.
While he was at it, he raised
a most disquieting question. Since
there are no industry manufacturing
standards for component phasing in
any products other than power amps
and speakers (and not all manufac-
turers conform to the latter two
either), it is a matter of pure
chance whether a given cartridge
will produce a positive or a nega-
tive pulse when fed a positive in-
put pulse. Since polarity can make
a rather substantial difference
in how a system will sound, substi-
tution comparisons between competing
components cannot be valid unless
it is first ascertained that both
are producing outputs of identical
polarity. Has any magazine been
doing this? You bet your sweet
apple they haven't! (And that in-
cludes us.) We can assure readers
that, in future, we will watch out
for this little pitfall. And if
our imitators don't immediately
follow suit, they'd better be able
to offer a good reason why.

Scott-Free CB
The following news brief came
off the AP newswire for March 22,
1978, under the heading "A CB
Near-Disaster."

A Federal Communications Com-
mission official reveals that a
CB radio operator using illegal
high-power equipment interrupted
delicate communications during a
jet hijacking last week. Serge
Marti-Volkoff says the CBer -- no
identity given -- has agreed to
stop using the equipment and won't
be charged. Communications were
interrupted between the airport
in Oakland, CA, and the hijacked
jetliner, which was later flown
to Denver, where the hijacking
ended without violence and the hi-
jacker was captured.

Why, we ask, wasn't the slob prose-
cuted? Illegal CB operation is
no less illegal than illegal
parking, but if someone endan-
ered the lives of people in a burn-
ing building by illegal parking
that blocked access to the fire
truck, he'd get the maximum sen-
tence allowed by the law, and no
ifs, ands or buts.
The FCC keeps telling us the
reason there is so much abuse of
CB is because "they don't have
the personnel to track down the
violators." Then they catch one
red-handed after his illegal ac-
tivity nearly causes a "disaster"
and they let him go on a promise
that he'll be a good CBer in the
future. No wonder CBers think no-	hing of flouting the law. What
do they have to lose? Apparently,
nothing!

The Establishment Looks at Direct
According to Billboard, the
music-industry weekly,* the "major"
record companies have been watching
with increasing interest the recent
proliferation of direct-to-disc
recordings. Do you believe that
is because they are interested in
producing better recordings? Or do
you prefer the theory that they
see a lot of record-buying dollars
being diverted from their pockets
into someone else's? Do you believe
in Santa Claus?

Be that as it may, the biggies
are so upset about D-to-D that
some of their bigwigs condescended
to participate in a panel discuss-
ion on the subject at the AES con-
vention in New York in February.
RCA classical producer Jay David
Saks' main objection to D-to-D was
that musicians preferred the note-
perfect recordings they could make

* That's right, Virginia, music
isn't an art any more, it's an
industry.
by editing. CBS's classical producer Andrew Kazdin, on the other hand, raised an objection to direct which seemed almost grotesque in its irrelevance. We quote:

"I believe there is more to be got out of, say, a 100-piece orchestra, than you do by hanging up two to three mikes with direct."

Most d-to-ds are multi-miked.

Measuring Mats

We noted with interest an item in England's leading audiophile magazine, Hi-Fi News and Record Review," suggesting how one might go about making subjective assessments of the effectiveness with which a turntable platter mat damps vibration of the vinyl disc. It is simplicity itself -- once you've found a test record that fits the bill. The disc should have on it at least one band of high-level program material as well as some silent grooves (as are used for assessing turntable rumble). Also needed are either a Watts Dust Bug or a second tone arm and cartridge on the turntable unit.

Here's how it works: Set the playback volume to the usual position for listening and put the playback pickup at the start of the silent grooves. Then put the other pickup (which doesn't need to be connected to anything) or the Dust Bug in the modulated grooves and listen to what comes through the system. The worst mats -- or idiotic platter designs like those from Transcriptors (which support the disc only at its perimeter) -- will produce the most output from the system. A good, highly-effective platter mat will produce virtually none.

This does not of course duplicate the normal situation of a single pickup playing a disc for listening purposes. It merely illustrates that the tracking of modulations does in fact set up resonances in the vinyl of a disc, and since resonances invariably smear detail, it would seem to follow that a mat which damps them will improve the clarity and detail delineation of disc reproduction. That, in fact, is exactly what it does.

Reader Stanley Lipshitz, whose investigations of absolute thasim were mentioned elsewhere in this issue, has proposed that this test be taken further, using a sine-wave tone cut for the modulated band, as a means for making comparative measurements of platter-mat damping, by metering the amplitude of the signal picked up by the cartridge that is playing the unmodulated groove.

Our suggestion: If someone would cut a disc having a series of impulses in one band and silent grooves in another, the output of the cartridge playing the silent ones could be analyzed with the instruments now being used to assess loudspeaker pulse response or environmental reverberation.

The VTA Dilemma

We got together a few weeks ago with David Shreve, who has probably done as much work in the field of phono vertical tracking angle (VTA) as anyone, for a demonstration of his findings and some brainstorming sessions on the subject.

Shreve uses a modified Rabco SL-8E straight-line-tracking arm for his experimentation, mainly because that arm allows for more precise adjustment of VTA than any other available.

Our findings were both conclusive and provocative. To wit: Vertical tracking adjustments as small as a few minutes of one degree were audible, and only one adjustment sounded "right" for any given disc. The optimum VTA varied from disc to disc. With the cartridges used -- a Denon elliptical and a Shure spherical (and remember that sphericals are least critical of VTA adjustment) -- the optimum adjustment for each disc was within less than a degree from the cartridge manufacturers' recommendation that the top of the cartridge body be parallel to the disc. But the most perplexing
Reprints and Back Issues

Three years ago, we ran off 1000 copies of a softbound reprint of our first 12 issues. It sold so well that we went then and did likewise with our second 12 issues, which is also moving quite nicely thank you. Supplies of both have dwindled gratifyingly, but both are still available for $25 each (although Volume 1 won't last much longer). If you are curious about how, and why, this whole business of perfectionist audio got started (It was all our fault, remember!), these two reprints are a compact history of the whole sordid affair. But if you want them, we'd advise ordering these now, because when they're gone, that's that. We will not reprint them again. Who knows? They may become collector's items.

Both, by the way, are 8½ by 11-inch size (That's the way we were!), Volume 1 has 240 pages and covers the years 1962 to '66, and Volume 2 has 290 pages and covers up to Spring '71.

Also available in limited quantities, for $3 each, are original copies of back issues dated: Autumn '71, Winter '71/72, Summer/Autumn '73, Autumn/Winter '73, Winter '73/74, Summer '75, Winter '75/76, Summer '76, Autumn '76, Spring '77, Winter '77/78, and Spring '78. See the subscription coupon in this issue for ordering information.
finding of them all was that, even when the VTA was precisely correct, the sound was affected by the height of the tone arm's pivots above the disc surface. With exactly the same VTA setting -- say, 10 minutes of negative rake beyond the "normal" cartridge angle, the sound was perceptibly cleaner and more detailed when the arm pivots were 1/2 inch above the disc than when they were 1/4 inch above. And in the 1/4 position, it was not possible to find any VTA setting that was as good as the best obtainable at the 1/2-inch height. This makes no sense at all!

What did we prove? VTA does make a difference, but the possibility of finding the precisely correct setting with any arm that lacks the Rabco's vernier-type adjustment is practically zilch.

If you don't mind diddling endlessly, you can try it with your SME or Black Widow or Formula 4. But for all practical purposes, you can come close to the optimum VTA just by following the cartridge manufacturer's own instructions, and mounting it so that the top of the cartridge is parallel to the disc surface. You could also do worse than to do this with the arm's vertical pivots (about which it hinges vertically) 1/2 inch above the disc surface. Since we have no idea why this works with the Rabco, there is no reason to expect that it wouldn't work with some other arms too. We couldn't decide whether or not the 1/2-inch-raised base improved the sound from a Formula 4, because it was impossible to ascertain whether we were hearing the effects of the raised base or of changes in VTA. The Formula 4, like most other arms, has no provision for really precise adjustment of VTA.

Despite the evidence of our ears, we find it difficult to accept at this time Dr. Shreve's contention that it was VTA changes alone that we were hearing. On a very long shot, we are hazarding a guess that what we may have been hearing some-how was minute changes in the resonance patterns being set up in the gantry frame of the arm, as a result of changes in the direction in which arm vibrations were being imparted through the vertical pivots into the gantry. That is about as far-out an explanation as we've heard for some time, but it's the best we can do now. We'll welcome any better ideas from knowledgeable readers.

Meanwhile, we are also entertaining a gut feeling that the absolutely hairy delicacy of the VTA adjustments, as demonstrated by Dr. Shreve, suggests that they are acting to cancel out certain things in the disc sound which the listener finds unattractive. There is not, for example, any way as yet of instrumenting a VTA adjustment with anywheres near that degree of precision. The adjustment must be listened to, and it is inevitable that the "rightness" of a given adjustment must consequently be judged on the basis of how the disc sounds through a given system.

For example, VTA changes can seem to sharpen or sweeten the high end of a given disc. Whichever setting sounds most "right" will depend on what kind of top was fed to the disc to begin with, as well as the high-end characteristics of the playback system.

In short, the whole VTA business is so up in the air now, and the theory behind it so tenuous, that we would not advise the average phonophile to bother with it at all. Set the cartridge in the arm as recommended by the manufacturer and forget it.

Why Can't They...
...taper the rear end of AC and audio plugs so they don't get hooked on loops of adjacent wire?
...make phono cartridge connecting pins the same size so we don't have to adjust the connecting clips every time we change cartridges?
...put banana-type receptacles 3/4 of an inch apart so one can use a dual banana plug to connect to

56
HAVE YOU VISITED Lyric High Fidelity's Listening Room? If not you should come and discover what choosing audio equipment ought to be like.

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We invite you to come and experience these masterpiece components. Listening Room hours are 10 A.M. to 6 P.M., Monday through Saturday.
them?
...publish effective mass figures for tone arms, and compliance figures around 10 Hz for cartridges, so we can match one to the other without guessing?
...put power amplifier output terminals where we can reach them without turning the infernal amplifiers upside down, sideways, or slaunchways?
...put a spot of cement at the junction between those hair-fine tone-arm wires and the cartridge clips, so they don't fall off at the first flexing?
...standardize preamplifier connections so that all of them have their left-channel inputs along the top and right along the bottom?

Last-Minute Updates
Tested but not yet written up as of press deadline were the new Denon 2050 turntable and the Shure V-15-IV cartridge. Both are superb and highly recommended, despite the predictably prejudiced report on the V-15-IV in another audiophile rag.
The M-Z Mod 3 speakers reviewed last time have undergone several modifications since then. Current production has no spurious brightness and slightly better although still somewhat soft high end.

On and Off the Charts
As we go to press with this issue, the grapevine tells us that the current components-of-the-month are a new Lux turntable with flashing lights and an ingenious arm-release arrangement that facilitates cartridge changes, an all-dynamic speaker system from designer Mike Wright (of Dayton-Wright fame), and a power amplifier with the unlikely brand name of Bedini-Strelisoff. We'll test them all eventually, if they stay in favor for long enough to take seriously.
The hand-made Swiss Breuer tone arm that was getting rave reviews in the European press and, more recently, from some US buyers, has reportedly been discontinued, although customers are being told that limited numbers are "still available." Since it was not available in anything but limited numbers even when it was in production (we gather only about 100 were made), "limited limited" would seem to suggest that the likelihood of getting one is slightly better than the odds of getting beaned by a meteorite. If it isn't being produced, and it was as good as it was cracked up to be, maybe someone else will take on the manufacture of it. If no one elects to do so though, what will those audiophiles who paid $600 for it do when and if it needs repair or, even, a refill of the proper damping fluid? This is the kind of risk anyone incurs by spending that kind of money for products that are hand-crafted by some lone genius working out of his basement. When he is gone, for whatever reason, the days of that product are numbered according to its longevity. Did you ever try to get an Acoustech solid-state amplifier repaired since the mother company folded? If it doesn't become "a classic," in continuing demand, an orphaned component is about as welcome in a repair shop as the PLO at a bar mitzvah!

EQUIPMENT REPORTS INDEX
A complete index to all equipment reports in Vol. III through Vol. 4 #1 is now available from us for $1, postpaid.

Ad Quote
"Our Tech-craft TCB-125 professional amplifier drove an electric drill for a solid week, continuously. If it can handle a drill, you can be positive that a Tech-craft amplifier can handle any speaker load under virtually any conditions...beautifully." (From an ad for Bogen Tech-craft in the April 1978 dB.)

But will it remain stable with an oscillating sander?
The fabulous sound of Direct-To-Disc.

It's no accident. In fact, it represents the most painstaking effort to capture sound one could imagine. It starts with a "perfect" studio. No hum. No noise. No distortion. Everything working exactly right. Because you can't afford surprises.

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Now you're ready for musicians of the highest caliber. Artists who respond to the challenge with a concert that sparkles with the creative energy generated only by a "live" performance.

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Direct-to-disc is far more than a sensational demonstration of the capabilities of high fidelity. It is also a dramatic testimonial to the excellence of men and technology when driven to the highest possible standards.

At Audio-Technica we've long felt that the art and science of disc recording were capable of far more than what you hear on an average record. Sample the proof today at your A-T dealer.

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NEXUS Ragtime Concert DD-2
ZIMBALLIST Violin Sonatas Philip Frank, Violin, Bernard Frank, Piano DD-3
BIG BAND JAZZ Rob McConnell & the Boss Brass (2 record set) DD-4 $21.95
CANADIAN BRASS QUINTET Bach, Purcell, Jelly Roll Morton DD-5
TORONTO CHAMBER ORCHESTRA Boyd Neel Mozart Program DD-6
BIG BAND JAZZ, VOL. 2 Humber College Jazz Ensemble DD-7
TORONTO CHAMBER ORCHESTRA, Boyd Neel J. S. Bach Program DD-9

**SONIC ARTS**
SCHUMANN "PAPILLIONS", David Montgomery Also Liszt, Chopin (Binaural Recording) SA-LS5
FOUR-HANDED PIANO RAMS, David Montgomery & Cecil Lytle The Entertainer, Kitten on the Keys, 7 others SA-LS6
WOOFERS, TWEETERS & ALL THAT JAZZ, Jazz and sound effects (Binaural Recording) SA-LS7

**VIVALDI TRICENTENNIAL**, Ohmaya & The Cremona Chamber Ensemble Opus 8, No. 1; Opus 2, No. 2; Opus 3, No. 11 SA-LS8
THE JOY OF MOZART, G. Cleve & Mozart Festival Orch., Symphony #38; Divertimento For Strings SA-SL9

**TELARC**
THE GREAT ORGAN AT METHUEN, Michael Murray Widor, Vienne, Dupre, Karg-Elert, Marcello, TEL-5036

**RCA/RVC (All RCA/RVC are 45 RPM)**
STOCKHAUSEN: Zyklus, NODA: Eclogue Sumire Yoshihara, Masami Nakagawa RDC-1
TOKYO VIVALDI ENSEMBLE, Beatles Medley, Vivaldi Concerto in E, Op. 8, No. 1 RDC-2
TRACKIN' Lew Tabackin Quartet RDC-3
BEETHOVEN "Appassionata" Piano Sonata Ikuyo Kamiya at the Bosendorfer "Imperial" RDC-4
WARREN SMITH & TOKI, Sax & Percussion RVL-8501
WARREN SMITH & MASAMI NAKAGAWA Flute & Percussion RVL-8502

All single records are $14.95 retail; 2-record albums are $21.95. Records are available at most Audio-Technica high fidelity dealers and fine record stores, or write to us for current title list and ordering information.

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Letters

Storing Discs

I have a question regarding the preservation of long-playing stereo discs. I buy certain discs, tape them for listening, then store the discs away from humidity and heat. I do this for possible investment purposes; the discs may be worth something ($$-wise) 10, 20, even 30 years from now.

My question then: Is there a life expectancy to these once-played discs so that nothing I do will keep them in mint condition? Or, will my storage of them actually preserve them for years to come?

Harry Engel

As time passes, the plasticizers will leave the vinyl, making the discs harder and more brittle. The sound, however, may be expected to improve rather than to deteriorate as a result of this.

The reason? As the vinyl material becomes harder, it will not yield as much in response to pressure from the stylus. At high frequencies, where stylus mass causes the stylus to "resist" the groove motions, the relatively soft vinyl of a new disc will be momentarily indented by the passing stylus. Thus, the stylus will not move as much as does the groove, and the result is a slight loss of high-frequency response.

After a disc has lost its plasticizers, there is less of this yielding, so the disc will (with a given cartridge) be found to have slightly more-extended high-end response.

The hardening will also make the entire disc less flexible so that, after 20 years or so, those floppy discs in your collection may become as easily breakable as the most fragile 78-rpm discs.

An article on preservation of valued tapes and discs is scheduled for a future issue.

Unwarping Discs

Re your comment on page 68 (last issue) re unwarping discs without ruination. Here is a method that works.

Take about 30 warped singles and place them in a horizontal stack on a flat surface. After a few weeks you will find the bottom discs are playable. It is as simple as that. I play my discs off the bottom of the pile. Discs that have been straightened out tend to warp again if not kept under pressure.

Henry F. Robbins, President, Gillette Gramophone Group

Recordings and Microphones

I thought the attached summed up the current state of recordings quite well. As the song says, "When will they ever learn?" ("The attached" was an item from the English Hi-Fi News wherein HFN pundit Angus McKenzie reported on the sonic superiority — relative to the Boston Symphony Orchestra recordings and broadcasts (all multi-miked) — of a simple two-miked recording of the BSO made by Posthorn Recordings' Jerry Bruck. JGH)

My May issues of Audio and High Fidelity arrived on the same day. I was encouraged to read Bert Whyte's column. For the first time that I can remember, a mass magazine admitted that American records are often crummy, and imported pressings are usually notably superior. I became discouraged again when I read HP's assessment of the state-of-the-art (Pg. 25), which
JONAS MILLER announces some brand new super-stars

Here a a few of the world's best as seen and heard at the CES show. We predict they will be the big hits of the year.

Joseph Grado Signature III cartridge.
From the master cartridge maker. His latest and best, priced at $750.00.

Threshold 4000 Amplifier
It’s 200 w/ch. (typically 250/250) Class A + Cascode. Conserves heat and power. Drives even ½ ohm loads. Attention Dayton-Wright owners; you can go full-range with this superb amp. It’s the top value in quality and performance at $1825.00.

M&K's Volkswoofer
From the people who started it all; great performing subwoofers in small boxes at low prices. Now, the 1st complete internally amplified subwoofer in a small 2 cu. ft. beautiful cube, with servo-bass control amplifier performance, 100 Hz or 75 Hz flat to 22 Hz. Just connect it to any bass deficient system, (nothing else to buy) and “Voila”, glorious room filling bass, and the cleanliness of bi-amped sound. Only $425.00. Why pay more and get less?

From Revox 2 Spectacular Performers:
Straight line tracking turntable, B790
Quartz lock direct drive, floating sub-chassis, minimizes feedback. Includes M20E Ortofon cartridge. Typical European quality construction, complete $749.00.

Digital FM tuner B760
A Real Hit! 15 user-programmable Station selector memories, 25 Hz step synthesizer tuner, Quartz oscillator, FM Dolby optional; .7 mv. usable sensitivity. $1275.00

New Acoustat Monitor Speakers
It is a great challenge to all makers of “top value” speakers. We think this will win hands down in the "what you get for what you pay" category. Better looks, better dispersion, better value. $2800.00
concluded that electronics have gotten about as good as they are going to until digital reaches the consumer field.

I don't know whether the mass publications are getting better or worse. Maybe it just reflects the fact that Audio has never been as bad as High Fidelity or Stereo Review.

Now that Gately is out of business and the Sony C-500 is apparently no longer available perhaps it would be useful to look into more microphones and mixers. I have seen and heard very little about Schoeps microphones (they seem to be rare birds) but what little I have seen has been generally favorable. Have you had any experience with them?

I have a friend who recently bought an Akai Pro-1000, their new half track recorder. I haven't seen it in use or heard any results, but it has one interesting feature which seems to be a new trend from Japan. It has an external processor loop (a la PAT-5) through which one can hook up a dbx 157 with levels correctly matched and still use the output volume control for monitor level. It also has four mike inputs, two assigned and two with pan pots, i.e. a built-in mixer. But why for $2000 with a built-in mixer can't they provide balanced mike inputs? Why doesn't someone make a good-quality semi-pro recorder with no mike inputs, no mixing, just two line inputs with good quality, in-

stead of wasting money on frills? Speaking of frills, Japan's big one now is three separate settings for bias and equalization (and sometimes record level). There is something to be said for choosing a microphone to fit a given situation, but how many of us take three different tapes with us and then decide "Well, Maxell UD seems to be called for here!" In this age of inflation, what we need is a good, solid, no-frills, basic recorder which is easy to adjust and does its job well. I don't know of any such, do you?

Peter E. Upton

We, too, were sorry to see the C-500 microphone dropped from Sony's professional mike line. Those of you who never had a chance to try a pair can get a good idea of what they sounded like by listening to FMT Bob Fulton's ARK recordings. Fulton would never tell...

Enjoy your tapes and Dolby* FM broadcasts more with this versatile, low cost noise reduction kit. Latest design ICs, self powered, independent (just plug in tuner and recorder), complete with solid mahogany cabinet. No instruments required.

2 channel encode or decode $99.50 plus $3 shipping. 4 channel internal adapter $35 also enables simultaneous decode/encode. Order both for $125 and we pay shipping. Pa. residents add 6% sales tax.

*Dolby Laboratories, Inc.
ARG provides the best single review source for classical recordings currently available. . . . Overall the publication is extremely good . . .

. . . evaluation of the two new Meistersinger sets as compared with the previous editions, was a fine piece of high competence and polished judgment.

I have never read a journal with record reviews like yours—quality, reliability . . . you find yourself rushing to the record store with it, hoping they've got a few of the . . . records you recommend! Therein lies your strength, for a reader to go to the store and buy with confidence, often, a record (he's) never heard or heard of. I did that with your two recent issues and came home delighted with my new additions.

I'd like to compliment you on your magazine which I have just seen for the first time. I have been collecting records since the early 40s and have found record reviews eminently ignorable. What I have read in . . . ARG causes me to reconsider . . .

. . . another striking combination of the "in-depth" review (Karajan's Bruckner 8th) plus your excellent regular features. Most of your reviewers do seem to be comparing versions, and are aware of the past, and it's good to see a regular column on imports.

I'm pleased that you review imported records and that you assign two reviewers to major releases such as Haitink's Beethoven cycle . . . (The) review of the Nielsen symphonies was a model of the kind of description and comparison such a review should include.

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us whether or not his were C-500s, modified or otherwise, but his discs sound like C-500 pickups.

The Schoeps microphones beloved of perfectionist recordists (including those engineering some of the super-fi discs now coming in from Japan) used tube electronics and have been superseded by an entirely-solid-state line of Schoeps mikes that many users have found to be less velvety-smooth-sounding. We have heard some excellent sound from recordings made with microphones from a small English firm called Calrec, whose condenser mikes are said to sell for quite a bit less than a comparable pair of the better-known (Neumann, AKG) professional condensers.

We hope to have a report on both the current Schoeps mikes and the Calrec in future issues.

Unbalanced mike inputs conform to professional practice. Pros like to choose their own input transformers (which provide the balanced termination), most of which are now available with phone-plug outputs for direct connection to unbalanced preamp inputs.

Revox has an A-77 model which precisely meets your description of a no-frills, cost-effective deck: The A-77 Professional has 7½ and 15-ips speeds, 2-track, 2 meters, line-level inputs only (with pre-set levels), and adjustable-level outputs to drive small monitor speakers or any headphones, including electrostatics. The standard unit, however, has European CCIR equalization; for compatibility with other US recorders, you should specify that it have NAB equalization.

Revox designer Willi Studer agrees with you about bias and equalization switching being an "unnecessary frill." We disagree with both of you because, unlike professional recordists who tend to use the 15-ips speed exclusively and always record in short bits and snatches, amateur recordists must often (for reasons of uninterrupted running time) use the 7½-ips or occasionally the 3-3/4-ips speed, and slower speeds require different tapes having different bias and equalization requirements. It is fine to play the role of uncompromising perfectionist when faced with the choice of recording a concert at 15 or at 7½, but much of the shine wears off that idealism the third time a live-performance recording runs out of tape 3 minutes before the end of the program.

Airborne AMTRAK

Your last issue (page 66) contained one of the funniest goofs I have seen in any magazine for years. The illustration shows an airliner above the high buildings, which is clearly identified as a train. How could you!

Pat O'Donnel

Believe it or not, it was intentional. Most of the items in the diagram needed identifying for clarity, but it struck us that put-

HIFI / STEREO

is either musically right, or it's not. A small piano, a normal piano, a grand piano, and a concert grand—each is musically right, though differing in size, tone-volume and price. Similarly, when urged to develop neutral equipment, we arrived at different sizes. Our Bopp-Lab-Matic preamp/amp and our Bopp-Lab-Static speakers are built to complement each other for optimal musicality. Thus they are sold as a unit.

To keep in touch with our customers, we sell direct from our workbench, saving you time, trouble and money. We produce only in small runs to maintain the maximum musical quality. However, we would prefer not to call our equipment state-of-the-art anymore.

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Paragon       Spendor
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Grado         Bowers & Wilkins
Verion        Harbeth
Grace         DCM
Linn Sondek   Janis
Jim Rogers 149
Levinson HQD Reference System

“With proper source material, the HQD System will reproduce a musical event better than any system we know of.”
M. Levinson

Jack Rubinson  
Audio Consultant and  
Founder of Chestnut Hill Audio.

Chestnut Hill Audio.  
2302 Lombard Street  
ting the word "Airplane" next to what was so obviously that, bordered on the absurd. So we didn't.

Stereophile Critic

Your nasty but, I feel, justified crack about Audio Critic's distinction between reproduced accuracy and musicality must have really hit home. Its reaction (see the enclosed Xerox) was so close to libel that I wonder if you plan to take any legal action. You really should, I think.

R. L. Blackmer

We considered it, but then we considered the source and decided not to bother. To quote Wm. Shakespeare on such matters: "The lady doth protest too much."

(The gist of "the enclosed Xerox" was that we are untrustworthy because we accept ads, because all the manufacturers advertising with us have at least one product listed in our "Recommended Components" section, and because we recommend a "time-smeread" phono cartridge, which probably means the Shure V-15).

Our preference for Shures is based on the fact that, being the flattest, smoothest cartridges through most of the audio range, they yield the most natural reproduction of musical instruments, which is what high fidelity is all about. (Not all audiophiles want musically-accurate sound, though; there are even ones who can listen to live music twice a week and still not comprehend what "musicality" is all about.) There's a good reason for our reputation as the most reliable judge of audio products, and it's the same reason why most of our subscribers are living quite happily with systems they put together from our recommendations. We are willing to bet that Audio Critic could not make that statement -- truthfully, at least.

For an embarrassingly objective assessment of AC's other allegations, readers need only note that one advertising manufacturer has never had a product in our Recommended List-ings, and another's costliest product got a grisly report in our last issue, in which they had a full-page ad. They did not run an ad in this issue, although the reason given was that they could not get it to us by press deadline.

On the other hand, that publication which attacked our credibility promised subscribers it would fulfill "the journalistic obligation to meet deadlines," promised manufacturers a fair hearing if they felt they had been unfairly treated in reports, and promised to admit to and rectify any technical errors it published. Instead, it has made excuses for its continuing tardiness, replied to manufacturers with rudeness and sarcasm, and summarily dismissed as nonsense any questions from readers about the accuracy of statements it has made in print. And that's the magazine whose editor demanded, like a scorned Jehovah, to know how Stereophile could DARE to question its credibility! Well, that's how.

We have often disagreed with The Absolute Sound's judgements, but we have never had reason to question its commitment to accuracy and its responsibility to readers and manufacturers. We regret that we cannot say the same of Audio Critic, whose pose of arrogant omniscience and scornful self-righteousness can only serve ultimately to undermine the respectability of all the so-called underground audio magazines in the eyes of responsible members of the audio community.

Back to the Fold

I have been unhappy lately with much of what you have been doing (or not doing) in Stereophile. For examples, I cite the paucity of component reviews, the wastage of space on components of little reader interest, and William Marsh's record reviews that have nothing to say to a reader who knows something about recording techniques. I let my subscription lapse 6 months ago because Absolute Sound seemed to be more like what I was looking for
The One Audio System Money Can't Buy

One of the given is that top equipment costs top dollar. There's no getting around it.
So instead of wasting time shopping price, shop something else: expertise.
Even in this business, it's a rarer commodity than you might imagine. "Expertise" is a good reason why a growing number of audiophiles are now clients of Mel Schilling. (Some even sticking with him after he left Willow Grove, PA for California.)
When you're laying money out for Electro Research, Infinity, Great American Sound, Paragon, Grado, etc., you have the right to expect a thoroughly professional analysis of your needs, a discussion of the components at the level you require to make an intelligent buying decision, and a relationship founded on a mutual commitment to the outer reaches of the state of the art.
Mel Schilling gives you exactly that from the moment you call or stop in.
It's something you never have to pay for. But it's something you can't find anywhere else.

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in an undergrounder. Now I'm coming back to the fold.

TAS is fascinating to read, but many things about it worry me. I find I agree more with your assessments of speakers than with theirs. I have been happier with discs I bought on your recommendation than theirs. I have missed your "how-tos" and your lucid explanations of things TAS only alludes to (as though they are beyond my comprehension). I don't really believe every top-rated component can be bettered by another from issue to issue, as TAS would have us believe. I am starting to feel very insecure these days without Stereophile's stabilizing influence. So sign me up again. J. Bailey

State of Confusion

The audio scene is in more confusion than I have ever seen it in my almost 40 years of interest in sound recording and reproduction. Every parameter is under challenge. The situation reminds me of that in Physics at the turn of the century when some physicists felt that everything was known and only the last few decimal points were required to complete all knowledge, while others felt that Physics was back to square one with all the apparent contradictions!

While the age of individual achievement seems to be a thing of the past and progress now seems inalienably wedded to the "communal effort", we are badly in need of an audio Albert Einstein to clear up the current mess. The Rappaport PRE-1 preamp with comparatively low slew rate, the sonic performance of Mitch Cotter's Verion Input Transformer and the sonic improvements with his NF-1 device (which chops off everything in the audio spectrum other than 18 Hz to 35 kHz) are going to drive the Manic-Measuring-Minded-Technocrats (MMMT!) quite mad!!

The massive solidity of the Dynavector DV-505 tone-arm and the "aircraft-carrier" look of the SME arm are a real shock to the "soda-straw-construction" arm addicts. I held on to my SME-3012, dumping my SME-3009 many years ago. The mambo-samba performances of the latter displeased me greatly. I have no regrets at my action since I always felt that the stylus-cantilever combination needed a reasonable mass against which to work as a fulcrum -- shades of Archimedes wanting a (firm) place on which to rest his lever!!

English audio engineers are greatly upset by the findings of Paul Messenger and Martin Colloms in the October 1977 issue of HFN/RR re the sonic superiority of the Lux Tube jobs over the solid-state efforts! Incidentally, how come hardly anyone is breathing a word about the highly praised Sheffield Records being cut with tube equipment? (See Andrew P. Teton's "The Sheffield Story," Audio, Vol. 61, No. 1, Jan. 1977, page 34.)

I have been fortunate in recovering a (small) part of the enormous amount of audio literature I dumped about 11 years ago, when it appeared that tubes were dead and solid-state totally victorious. I had complete sets of several journals, Audio, Audiocraft, Hi-Fi News, Tape Recording and many others. I retrieved a few issues of Audiocraft and nostalgically re-read your contributions. A few issues of my formerly complete set of High Fidelity in its halcyon days also warmed the cockles of my heart and made me want to kick myself more than ever, for my insane iconoclasm in getting rid of all this literature. Well, I did have a few years of virtually undisturbed enjoyment of music!

Two colleagues and I are handing out to Ike Eisenson the results of our study, research and experimentation -- our combined experience totals over a century -- I may have told you this before. Our discourse on formants in Eisenson's Audio Update Eight should drive the purely-electronically-oriented audio engineer gibbering!! Why is it that these, and the MMMT, (see ante)
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seem to have, so often, an active dislike for the very animal they are committed to care for and feed—music? Weird! I know some of this ilk whom I cannot haul out to live concerts, even with a bulldozer. However, they will happily listen to "music" (?) through a JBL Monitor!!!

Lionel A. Seemungal

The Junky Planets
I really like Stereophile, but other than telling you that, I feel it necessary to bring to your attention an album I purchased recently. It is "The Definitive Planets: Holst," on Stanyan Records 9017, and "Produced for Stanyan Records by Rod McKuen in association with E.M.I. London."

This disc is a re-release of the Sargeant-BBC-Columbia disc, long ago out of print, and I feel it was the best performance of "The Planets" on disc. However; all I can say about the Stanyan-EMI disc is "UGGGGGGGH!!" Compression is constant, a mid-bass boost with absolutely no true bass notes along with a zingy upper-middle make for an intolerable listening experience which cannot be improved with equalizer or dbx unit. Please review this disc, if only to save some other sucker the $10 to $12 they will spend for this piece of junk.

John L. Hamm

Why should we bother to review it when you just did?

Tube Sounds
Audiophiles who own tube electronics which require ECC83 or 12AX7 tubes ought not arbitrarily replace their tubes with Telefunken. Though the extent of change may vary from circuit to circuit, there is a clear and distinct audible difference between Telefunken's ECC83 and their ECC83/12AX7 tubes when interchanged in the same circuits. The most striking difference is that the ECC83/12AX7s have more of the properties of dimensionality, depth, smoothness, liquidity, warmth and sweetness. ECC83s have more definition, airiness, and transparency.

Along with the aforementioned differences, signals passed through 12AX7s have a tendency to sound distant and veiled with transient material seeming overly rounded. Signals passed through ECC83s have a tendency to sound etched, hard and edgy, much like most transistor circuits. I cannot say that these differences will appear on every piece of tube equipment. However, I have noticed them to varying extents in every circuit I have worked on, which include Ampex, Audio Research, Dyna, Marantz, McIntosh, Revox, as well as the circuits of DKL, Audio Dimensions, Trevor Lees, and Triode Lab.

For fear of getting too technical, I recommend, without explaining why, that you not use ECC83s in your phono stage or any stage which has marginal open-loop overload characteristics. The results may remarkably simulate the sound of a phono cartridge which is either misaligned or mistracking. Telefunken's ECC83/12AX7 will most likely provide the most pleasurable listening experience. However, one owes it to oneself to try the ECC83s in the high-level stage, especially if over-all feedback can be reduced or eliminated.

Lee Brown
Triode Lab
518 Monroe
Ann Arbor, MI 48104

Top Cassette
I strongly disagree with your putting any cassette deck in your Recommended Category A. The cassette medium, by its very nature, can't match open-reel recordings, even at 3.75 ips.

Robert Sellman

You're right, of course. That cassette deck is listed as an A unit simply because it is the best cas-
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sette deck made at the present time. It offers the best sound reproduction obtainable from cassettes. If you want the best available from any tape format, open reel is the route to go now, and PCM may well be the route to go in a year or so.

We regret the confusion those cassette-recorder listings may have caused. We assumed that our readers knew that no cassette deck can equal a good open-reel one, and assumed that you all knew that we knew what we assumed that you knew. But maybe not.

Un-Recommended Components

Quite a number of issues back, you ran a list of components that you had tested and found wanting. Isn't it time you laid that on us again?

Roger Dinsmore

No sooner said than done! There's an un-recommended components list in this issue.

The Other Side of the Coin

Managing an audio store in a high-income area was quite an experience for me. As an audio perfectionist with a sales background it became obvious after a few weeks that "we" (audiophiles) represent less than 2% of the audio purchasing market. And that particular 2% is not the group you can sell to; they're far too aware of all the components available.

It takes years of struggling before a high-end store starts to break even. So when you consider the fact that over 90% of system sales are not in the $2500-and-up category, you can see why it becomes very difficult for a guy like me to make a living.

Saturdays at my store consisted of endless hours of audio talk with knowledgeable and friendly people who loved to discuss audio topics such as Cobra cables versus 14-gauge wires for speakers. These people, who I really liked and respected, were nonetheless not really customers. They parked their bodies at my store but they bought elsewhere. I was there to make a living, not to shoot the breeze with people who were customers of some dealer 3000 miles away! So I resigned after a couple more weeks because the store owner was more interested in being a consultant and giving away valuable information than he was in sales. I was trying to support myself -- waiting for that one-system-per-week sale and not finding it. Why? Because there are cheaper alternatives to a $400 Verion transformer, a $650 Janus woofer or $40 Cobra speaker cables. Not all perfectionists can afford these goodies, so they would come into our store to play with them for free.

To be honest, I searched for the prospects who make the big bucks, drive a Mercedes and own a big house. For these people a $3000 system is a trivial expense, but... "No cassette deck?" "You mean the arm won't lift at the end of the record?" "What about the radio part?" (We didn't carry tuners or tape decks.) Unfortunately, the man with limitless funds is used to being waited on -- as it were, to "put it in drive, not shift through the gears."

Perfectionists should know that the door swings both ways. All the successful audio store owners I know (not high-end stores) started out with money-making as their prime incentive, not a burning desire to simply share their interest in state-of-the-art equipment.

Now I'm back in the printing business where I should have stayed in the first place. But it's still fun to look back on my audio selling experience. I learned a valuable lesson. People who purchase a Levinson JC-2, a Verion transformer, a $600 Denon turntable without a tone arm or $40 speaker cables aren't being sold these goodies by a store salesman. They have already sold themselves...
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(Name withheld for several very good reasons)

Redundant Review

That was an interesting review an interesting review of the B&W DM-6.

Peter Gutterman

We caught the redundant paragraphs but not in time redundant paragraphs but not in time to correct the error. Thanks, though for to our attention.

The Nominess Are...

I feel that you have a fine magazine, but I believe that you should aim an expanded portion of your publication to those, like me, who are limited in what can be invested in a music reproducing system.

Having a limited amount to spend on a high fidelity system should not have to mandate a made-in-Japan, highly-commercialized, mediocre-fidelity system. But not all of us are willing to try our luck/skill at assembly kits.

There are myriads of options in the $1000 to $1500 price range; and myriads of people in the same position in which I find myself. I suggest that your readers nominate components, and when enough interest is noted in a particular item it could be tested and reviewed for all to see.

Tim Brooks

Okay people, let's hear from you.

Who Indeed?

My answer to the question raised in your anniversary issue editorial ("Who's Right?") is "Who Cares?"

I enjoy reading all the leading undergrounders and I find the disagreements stimulating. As far as I'm concerned, I hope you don't all start agreeing with each other. It is healthy discussion that makes any field grow.

John McCleod

Obviously you are one of those audiophiles whose reading needs are adequately met by what we have come to call "audioporn," which we define as colorful and highly descriptive writing about components you would secretly like to play with but never really intend to buy.

If you were seriously considering the purchase of a component that you can't audition yourself before buying, you would be a lot more concerned about which reviewer(s) gave it an accurate assessment, and a lot less inclined to be satisfied with stimulating but ultimately inconclusive discussions about that product.

Preferential differences are fine, but disagreements about what is heard can only serve to hinder advances in the field.

Tin-Eared Musicians

Somewhere back in your dim past I remember your having made the statement that professional musicians are lousy judges of fidelity because all they listen for is the playing and/or the interpretation of the music, ignoring the sound.

More recently, you have been bragging about the fact that some of your "trained listeners" are professional musicians. Are they or are they not judges of fidelity? Make up your mind.

C. A. Norton

Some are and some aren't. We were, we confess, guilty of over-generalizing when we made that sweeping indictment of all practicing musicians as being tin-eared.

It may not surprise you to learn that, when it comes to the instruments they play, professional musicians are exceedingly picky about sound, and may try out as many as 20 contenders before buying one -- usually for more money than they had intended to spend. (Does that sound familiar?) Thus, while a clarinetist may be oblivious to
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the subtleties of violin reproduction, he is a merciless critic of the quality of reproduced clarinet sound. To him, natural reproduction means the ability to identify the make and, often, the vintage of a recorded clarinet.

On the other hand, it may surprise you to learn that some professional musicians are also serious audiophiles. And these people, who live in the worlds of both slew rates and schleiferen, are often the hardest people in the world to satisfy with reproduced sound. We have one each of the above contributing their judgement to our component evaluations.

Preferring Tubes

I have a bone to pick with you concerning your stance on tube equipment vs. solid state equipment. Although you have stated that good tube equipment sounds better than solid state equipment (that is considered to be good), one could be misled into thinking that the differences are minute from looking at your recommended components section. This, I feel, is far from the truth. All of the solid state preamps and power amps I have heard (including the GAS Thaedra, ARC SP-4, Dyna/Van Alstine PAT-5, ARC D-100, GAS Ampzilla II, Son of Ampzilla and the Dyna ST-400) don't approach the sound of the Pro-Musica modified Dyna PAS-3x, the Stereo 70 or the ARC tube equipment when using live music as the standard of comparison. The solid state equipment seems to be unable to properly reproduce the essence of the instruments (the harmonic structures, etc.)

You seem to feel that tube equipment does the best job of reproducing music at the present time. If you really feel this way, then please state it much more strongly that you have in the past. William Parks

It isn't all that simple. A few recent solid-state designs, such as the Bryston 4-B power amplifier, are starting to equal tubes in high-end naturalness, and solid-state power amplifiers wiped out the best tubed ones years ago as bass reproducers. We will still stack up the best tubed amps against the best solid-state ones for mid-range naturalness and liquidity, and since we consider mid-range accuracy to be the primary consideration in any audio system, we still prefer the best tubed electronics to the best solid-state ones.

We must however emphasize the fact that this is a personal preference of Ye Editor and his listening cronies. It is also, we must add, a preference which seems to be shared by most of the people we know who are more into concert-going than into audio. But it is not a basis for our climbing out on the editorial limb and stating flatly that tubes are "better than" transistors. Transistors, by and large, provide better detail than tubes across the audio board, and to audiophiles who hear live music but rarely, detail is of more importance than correct mid-range tonal structure and transparency. Thus, they almost-universally consider transistors to be more accurate devices than tubes, and as far as their own criteria are concerned, they are.

We have stated our views on the tube-versus-transistor question strongly enough on occasion to offend a goodly number of both audiophiles and manufacturers who don't happen to agree with us. But apparently unlike some other "underground" magazines which shall remain nameless, we do not feel that we should be telling our readers what they should like. We prefer to describe what something sounds like, point out what we like, and let it go at that. Audiophiles who want their diapers changed should be reading our competitors.

Who, I would like to know, was responsible for appending that un-
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justifiably laudatory note about jacket notes to my introduction to the ABC Classics roundup in Volume 4 Number 1? Some of ABC's jacket notes are passable, but some are ridiculous. I did not, and would not, say they are "excellent," and your addition of that unauthorized comment will at the very least reflect poorly on my reputation as a reliable reviewer. I demand a retraction and an apology.

Margaret Graham
Contributing Editor

Mea culpa, we retract, and we apologize. It was the fault of Ye Editor, who thought Ms. Graham had told him over the phone how marvellous ABC's jacket notes were when in fact she was talking about the notes on one specific album.

While we're at it, we should also apologize to Crystal Records for what appears to be a cavil about the quality of their inner liners, under the review of the Ibert/Dubois disc on page 50 in the same issue. Actually, anyone bothering to read that goof a second time will have seen that it refers to ABC, not to Crystal. But we apologize nonetheless.

Incidentally, Ms. Graham in a less formidable mood asked if we might have more reader reactions to her reviews. What do you think? Is she doing the kind of reviews you want, or missing the boat? Let's hear from you about this.

More Definitions Needed

The similarities between listening to and evaluating audio components and the reading process itself are striking. In the light of your recent editorial, "Who's Right?" I thought you might like to be aware of the fact that there is yet another process of encoding and decoding involved.

Just as your evaluations of individual audio components take place against the background of your own previous knowledge of music (not to mention the over-all characteristics of the rest of the music system), so the reader must decode the information he or she is receiving via the written word and place it within the framework of his or her own previously acquired knowledge for comprehension. Such a knowledge -- called "communicative competence" by linguists -- includes tacit knowledge of semantics, syntax and phonology as well as social knowledge that insures that our language makes sense and is appropriate to the situation. While it is easy to see that a reader who does not share the larger society's opinion of murder will not fully comprehend "Macbeth" or "Looking for Mr. Goodbar," an assumption that he does is a safe bet on the part of the writer. However, the assumption that all readers will have identical understandings of what "brightness in the upper mid-range" means is not as safe.

The meanings assigned by various reviewers to terms like "musicality" and "accuracy" may, in fact, be indicators of hearing differences, but I think it likely that at least part of the problem lies in differing semantic interpretations of these words.

What can be done about these differences? It is clear that any attempt to standardize the communicative competencies of reviewers is even more difficult than standardizing a reference system. Words, like loudspeakers, depend on the other elements of the encoding/decoding system for their individual characteristics. We can, however, shore up our system of assumptions on the semantic level by defining and standardizing the terms used to describe sound so that even if they don't mean the same thing to every reader, they do at least mean the same things within the context of an individual reviewer's prose. I applaud your efforts in this area although I think that the editorial re-definition of what it means to describe sound perhaps necessitates a glossary as well.

Robert N. Russon
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Mr. Edison Announces
The Final Perfection of
the Disc Phonograph
as a Real Musical Instrument of the Highest Type

This new instrument is the result of many years of experiment and investigation by Mr. Edison. All mechanical timbre is eliminated. All sounds are recorded and reproduced with absolute fidelity to the original, and every shade of volume and overtone is preserved. The tone is superb. This instrument opens to music lovers for the first time the great store of fine music which heretofore has been impossible of reproduction.

The Diamond and the Disc

Changeable needles or points are not used. The reproducing point which traverses the record is a genuine diamond, permanently mounted; it is never changed and never wears.

The records are in a disc form, of a material which is new in chemistry and of so great hardness as to permit the reproduction of the myriad of faint overtones which alone give quality to music. These records are truly indestructible.

The method of recording these new Edison records is also new, and the processes of manufacture are unique and new in every detail.

Special Motor

The mechanism of this new instrument is powerful, and is governed as accurately as a chronometer in order that the pitch shall at all times be accurately reproduced.

Several thousands of these new Edison Diamond Disc instruments have already been shipped from the factory to music dealers throughout the United States and Canada. Go and hear the records—you will be surprised.

Write for booklet illustrating and describing the different models.

3 Lakeside Avenue Orange, New Jersey

The new principles and methods embodied in the Edison Diamond Disc have also been applied to the well known Edison Cylinder Phonograph, and the new Cylinder instruments are now on exhibition by Edison Dealers.
Announcing our new name . . .

AUDIONICS of Oregon

For nearly a decade Audionics has imported and distributed interesting audio products from Europe. Several years ago we began a research program to develop and manufacture our own products. Our new name tells you who we are and where we’re from.

Our engineering staff and associated designers are among the very best in the industry. Our production personnel have had over one hundred years total experience manufacturing some of the most advanced instrumentation equipment in the world.

AUDIONICS of Oregon is a small group of professionals working in a modern production facility designing and manufacturing state-of-the-art high definition audio equipment. Our products are sold by nearly 100 dealers in the United States and are available in Canada, Spain, Italy, Japan, Hong Kong, Sweden and Malaysia.

In sum, we are a group of audio professionals working to improve the state-of-the-art and to bring it to increasing numbers of listeners who care. Success is its own reward, but it has its problems as well. During the past few months we’ve enjoyed unprecedented sales as the word of our current products has quietly spread. As a result, we simply have not been able to keep up with demand. If your AUDIONICS of Oregon dealer has not been able to keep an entire system on display, please accept our apologies. If you have been waiting, thank you for your patience. Our production is increasing on a regular and controlled basis.

Our new BT-2 preamplifier, our PZ3 Series II power amplifier, and our T-52 vented tower loudspeakers are all moderately priced as high definition audio products go . . . individually or together as a complete system. Many consumers and dealers tell us they are the most cost-effective group of audio products available.

Our engineers and designers are working on several new products including a new hybrid digital/analog stereo power amplifier that is a technological and sonic tour de force and a new SQ* decoder utilizing the highly acclaimed TATE separation enhancement system that will convince even the most wary of the possibilities of four-channel sound.

AUDIONICS of Oregon has been around for some time. How much longer will it be before you get to know us? Please write or telephone us for the name of your nearest dealer as well as product information. Please mention the STEREOPHILE. Thank you.

*TM CBS, Inc.

AUDIONICS of Oregon

10950 S.W. 5th; #160
Beaverton, Oregon 97005

Tel: (503) 641-5225
TWX: 910-467-8728