

# THE B.A.S. SPEAKER

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## In This Issue

This month we depart from our usual format of including a member-written article. Instead, as promised in the March 1977 issue, we include technical information on the recently announced DiscTraker. Dr. Bruce Maier, president, the Discwasher group, promised this data in his lecture to the BAS. Its presence in the Speaker doesn't imply endorsement -- see our disclaimer -- but it is a reflection of the BAS's general interest in damping, and in this new damping format.

The idea of placing an outrigger damper on a cartridge shell is not unique to the DiscTraker. For example, a paper at the European AES meeting several years ago presented a similar idea, implemented in a different fashion (i.e. , hydraulic damping vs. pneumatic).

As for the presence of material from a manufacturer, this will not be usual. We discussed this sort of thing at a recent BAS meeting and the membership concluded that inclusion was permissible since the material is an outgrowth of a BAS meeting presentation and since it includes technical information not easily conveyed otherwise.

On the other hand, we'd appreciate your reactions -- both to this piece and to the possibility of others. In fact, we'd like to know how you'd feel about the BAS using its mailing list to send out other material from manufacturers -- e.g. , notices of discount offers -- at their expense. The mailing list would, of course, remain in BAS hands and we'd only use it for special notices -- like the discounts offered by Sound Concepts and Audio Pulse last year.

In other news, Scott Kent discusses the inadequacies of "slew rate" as a meaningful specification. We have reviews of five cartridges, of the Magnepan MG-II, of the dbx 157, of the Superscope EC-1 electret microphone (which may be a real bargain) and of the Pioneer TX-6500. And Dave Griesinger details the problems associated with making good cassette recordings.

Finally, we want to note the upcoming (September) elections and the equally upcoming vacancy in the office of the treasurer (see the note on elections) and to sound the call for volunteers to write meeting summaries. Applicants for either (or both) should write to Box 7.

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Membership dues are \$14 per year (October 1 to September 30) or portion thereof. Dues include a one-year subscription to the BAS Speaker. (Note that almost the full amount of dues is allocated to production of the Speaker. The local activities of the BAS are strictly self-supporting.) For further information and application form, write to: The Boston Audio Society, P.O. Box 7, Kenmore Square Station, Boston, Mass. 02215.

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## For Sale

\*Sequerra Model I FM Tuner with black anodized front panel. New. List \$3040, asking \$2300. Phone (319) 382-5918 after 5.

\*Dayton-Wright XG-8 Mk. I's (mint), 1/2 price; Quad 33/303, \$325; J. Sugden C-51/P-51, \$395; Sheffield Vol. 1; SME 3009 S/2 Imp. with two shells (unused), \$119; Groovac II; Revox A77 Mk. 4, high-speed, half-track (used one hour). (519) 945-8486.

\*One Beyer M 101 N(C) dynamic omnidirectional microphone, \$80 or b. o. One Beyer M 201 N(C) dynamic hypercardioid, \$100 or b. o. Both have std. 3-pin XLR connectors and case, stand adaptor, and cable. David Satz, 492-2263.

\*Rappaport PRE-1, \$495; Son of Ampzilla, rack mount, \$380; Pair Snell loudspeakers, \$1000; Yamaha CT-800 tuner, \$250; Stax SRX-3 headphones, \$175; Ariston RD11S turntable with Mayware Formula 4 and Sonus Blue Label, \$340; Pair Ambient SR-66 loudspeakers, \$300. Most with warranty cards, in excellent shape with all packing. Will deliver. Call Peter, (413) 665-2920.

## Wanted

\*Audio Research Dual 150; Naim NAP 250; Accuphase T-100; Radford tube amp. (519) 945-8486.

\*Used pre-recorded tapes. Will buy or swap. William McCarthy, (617) 432-0082.

## Elections, Constitution and Bylaws

BAS elections are coming up in a few months. If you want to run for office, you should announce your candidacy. Three of the four incumbents are seeking reelection: Jim Brinton for president, Al Foster for recording secretary and Frank Farlow for corresponding secretary. Harry Zwicker, after long and faithful service as treasurer, has decided to stand down at the end of this term, so we need a candidate for that post. This is not to say that you can't run for president, just that someone has to become treasurer. Throw your hat into Box 7, and we'll give you a free plug in the Speaker.

Also, if you would like a copy of the constitution and bylaws, send a stamped, self-addressed envelope to Frank Farlow care of Box 7.

## A Warning on Sound Affair

Member Zeke Zook has written to warn against dealing with Sound Affair of St. Louis. Zook states that he ordered an AKG cartridge from them in early December and paid for it with a bank check. To date, he says, Sound Affair has failed to provide either merchandise or refund, despite repeated inquiries. Advance with caution.

## Ampex Stereotape Rises Again

For a long time the principal source of pre-recorded open-reel tapes in the USA was Ampex Stereotape. But erratic quality and high overhead costs caused the demise of the Stereotape operation about five years ago. Since then the principal source of stereo and quadraphonic tapes has been Barclay-Crocker of New York, a group dedicated to providing a broad range of carefully made Dolbyized tapes. Barclay-Crocker is struggling for survival, and now Ampex Stereotape has been resuscitated as The Reel Society. Their catalog claims that the Stereotape dubbing facility has been overhauled to ensure consistent quality; each tape is a 7 1/2 ips Dolby encoded stereo or discrete quad tape with a Dolby calibration tone at the beginning. Available repertory to date consists of about 50 classical titles and a similar number of pop and jazz tapes. Single tapes cost

about \$8; 3-disc or 4-disc boxed sets of records (such as operas) are formatted on two tapes for about \$25. Labels include DG, Archive, RCA and London for the classics, ECM, Warner and Reprise for jazz and pop. So if you are fed up with warps, clicks, pops and inner-groove distortion, perhaps you should write to The Reel Society, P.O. Box 651, Arlington Heights, IL 60006. If any member has tried these tapes, let us know how well the dubs are being done.

-- Peter Mitchell (Massachusetts)

## The Other Side of the Story

Sometimes it seems as if rumors and uncertainties about chromium-dioxide tape will never cease, being continually revived and propagated by dealers, manufacturers and CU. For instance, the owner's manuals for Pioneer car stereos still warn about the supposed head-wear ravages of CrO<sub>2</sub>. So Advent has finally decided to fight back. They have published a white paper, "The Advent Chrome Paper," exploring in seven pages the arguments for and against CrO<sub>2</sub>. It's available on request from Advent. Incidentally, I use CrO<sub>2</sub> cassettes routinely in my Pioneer KP-500 and KD-12 with complete confidence and no problems. -- Peter Mitchell (Massachusetts)

## The Other Side of Phonograph Disc Error

Mitchell Cotter's discussion (April 1977 Speaker) raised quite a variety of interesting questions and pointed out some not generally recognized sources of error in phonograph disc reproduction. Inadequate time to deal with a complicated subject left several areas not covered, and hopefully, when he returns to continue his presentation, we will become even more enlightened.

All is not as bad as it might seem, however. One area of concern is the chisel-shaped cutting stylus, which cuts a stereo groove which cannot be resolved identically by a stylus having a finite radius (Pierce & Hunt, Journal of the Society of Motion Picture Engineers, August 1938). Fortunately, this problem was recognized early on, and though elasticity of the vinyl was not sufficiently considered, radius compensation, in the form of electrical correction of the signal fed to the cutter, has been used for at least twenty years. Many present cutting systems are set up for a relatively small amount of compensation to optimize for the .0002" radius of an elliptical stylus. RCA's attempts to introduce compensation (a part of the Dynagroove process) sufficient for the .0007" spherical stylus standard in the early sixties probably led to overcorrection, as "sinking" into the groove more closely approximates the modulation cut by a chisel-shaped cutter. Radius compensation should not be confused with diameter compensation, which is a high frequency level boost toward the inner grooves of a record to compensate for losses due to increased velocities. This practice also introduces distortion proportional to the corrected losses. Keeping the inner diameter larger than 6" by not using too high a cutting level or not trying to put Beethoven's 5th on one record side is a better solution. -- Scott Kent (Massachusetts)

## The Limits of Slew Rate

Two recent articles (Alvin Foster, "Low-Priced Receivers," BAS Speaker, June 1977, and Walt Jung, "Slewing Induced Distortion," The Audio Amateur, No. 1, 1977) have pointed up the inadequacies of using "slew rate" as a specification for high fidelity equipment. The problem is that without specifying the level one cannot compare, with any meaning, devices operating at different output voltages or powers. For example, a 25 Watt amplifier having a slew rate of 20 V/ $\mu$ s would pass a pulse with a rise time of 2  $\mu$ s and would clip at 14 Volts rms into an 8-Ohm load. A 250-Watt amplifier would clip at 44 Volts rms into an 8-Ohm load. In order to pass the same 2  $\mu$ s pulse at full power, the 250-Watt unit would require a slew rate of 60 V/ $\mu$ s. Both amplifiers would have the same ability to pass the same waveform at their respective full powers. The 60 V/ $\mu$ s device is not faster; it is merely capable of greater output voltage swing, which one might suspect from the Wattage ratings. When the comparison involves preamps, or other devices, operating at differing, and often unspecified, output levels, the specification of slew rate becomes even less meaningful. A solution is one I suggested during the Ojala/Davis debate: use rise time

at full power, or at rated output voltage, for preamps. This specification was used by several manufacturers ten or fifteen years ago, but fell into disfavor as they began to build stable amplifiers with the available transistors and found that to achieve stability, the rise time numbers could not be as impressive as had been obtained with peaked-up, unstable designs. Rather than advertise a poorer specification with the newer models, they dropped the spec.

Another performance subtlety of amplifiers using feedback should be mentioned. This is the difference between rise time (and bandwidth) of a circuit at small signal levels vs. its speed near clipping point. If only a single number is used to indicate speed, rise time at full output level is more informative than slew rate. With bipolar transistors, bandwidth varies inversely with current. In a power amplifier, rate limiting may occur well below full power. It is not unusual for voltage swing capability to increase faster mathematically than the bandwidth of the circuit decreases, disguising the fact that rate limiting may be occurring at a fraction of full power.

Slew rates of impressive numerical magnitude may be more easily obtained with higher-power amplifiers. A more accurate specification might take the form: rise time of  $x$ ms maintained to  $x$  Watts/Volts output. One can also interpolate the rise times at low level and full power from frequency response and power bandwidth, respectively, but the level at which rate limiting occurs is what's important. Unfortunately, life is complicated, and a single unrelated number rarely indicates anything.

-- Scott Kent (Massachusetts)

## User Equipment Reports

### SAE Impulse Noise Reduction System

Heeding the call for contributions, I recently put pen in hand to relate my superlative experience with Scientific Audio Electronics' new Impulse Noise Reduction System. After completing the first draft, I was somewhat stunned to find, in the March Speaker, two members panning the device. I have had the unit hooked up and in use now for over two months and give it a hearty recommendation.

The reason Messrs. Satz and Stevenson's experiences with the SAE 5000 differ so markedly from mine may be, in part, that their expectations have yielded unrealistic dissatisfactions. Not even SAE contends that the 5000 will make a silk purse out of a sow's ear. If you are diligent in your record care and carefully adjust the 5000 with an eye toward the louder passages of the material being played, your experience will likely duplicate mine: quite satisfactory and well worth the price.

-- Richard Grant (California)

### Some Cartridge Comparisons

Over the past year, I have had the opportunity to live with several highly reputed cartridges of both moving-magnet and moving-coil varieties. Though I can't say that I've found the "ultimate" cartridge, I can share some of my experiences with you.

The equipment with which the four cartridges (Supex SD-900 Super, Sonus Blue Label, Denon DL-103, Denon DL-103S) were auditioned consisted of a Mayware Formula 4 tonearm (for the Sonus), a Grace G-940 tonearm (for the others), a Technics SL-110A direct-drive turntable, G. A. S. Thaetra preamp and Ampzilla amp, and Magnepan MG-II speakers, augmented with an M&K subwoofer. For most of these cartridges, my comparisons were done by living with them for a number of weeks and listening to them. (Note that single samples were used. -- Ed.) I used no test equipment or A-B switchbox. In the case of the moving coils, I made comparisons by interchanging headshells in the Grace arm. My findings are as follows:

Supex SD-900 Super. This is an improved version of the Supex SD-900E moving-coil cartridge. The main changes are reduced mass (8 grams vs. 10 for the old model) and higher compliance ( $25 \times 10^{-6}$  cm/dyne). This cartridge is a super tracker; I couldn't get it to mistrack on any disc in my collection. Clarity and definition are really superior; drum transients are tight and quick, with good impact. The low end is also very good -- tight, solid and very deep. Unfortunately, the cartridge rings quite a bit. Bells and vibraphone tend to have an overbright, clangy quality. Also,

depth perspective is quite limited (though much better than the old Supex). This cartridge tends to dry up the natural reverberation in many recordings. On some rock recordings it sounds absolutely super. On many symphonic recordings, however, the dry perspective and bright high end are less than ideal. Make no mistake, though: this is a very good cartridge.

Sonus Blue Label. Peter Pritchard's new "wunderkind" has received much attention in these pages, so no more introduction is needed. This is a good cartridge, but far from the masterpiece that some have maintained it to be. My first sample of the Sonus Blue was defective: the stylus was not seating properly, resulting in a pronounced midrange depression. Sonic Research repaired it and returned it to me. I then settled down for some serious listening. The Sonus's main strength is its sweet, spacious high end. This cartridge has excellent depth of field; hall ambience is accurately reproduced. Despite the Shibata stylus, the cartridge is not overbright. The perspective of individual instruments in the orchestra (on a good recording) is very natural and convincing, though the overall perspective is rather distant.

Unfortunately, this cartridge has many flaws. First, the tracking ability is still only fair, despite the high compliance and the Shibata stylus -- which, incidentally, overemphasizes any slight surface flaw. And when it mistracks, you'll know it. High end overtones then become very rough. Next, the bass is very thin and lacking in impact. Definition in the low end is no match for any of the moving-coils. The cartridge also has a very low output for a moving-magnet type. These last two factors contribute to a lack of dynamic range. Recordings which sound dynamic and alive with a Denon or Supex sound less so with the Sonus. All in all, the Sonus is a very smooth, listenable cartridge, which can sound very convincing on a naturally miked symphonic disc, recorded in a good hall. Still, I prefer something like the Denon.

Denon DL-103 (conical stylus). The Denon DL-103 has been my primary cartridge for the past eight months. Of all the cartridges described here, this is the only one with a completely natural balance. As a result, one can literally listen to it for hours and never get tired. Definition is excellent, and transient response is good, though not quite as quick as that of the Supex. Piano and acoustic guitar sound beautiful with the Denon conical. Bass is tight, deep and well-defined; string tone is very sweet, though less so than with the Sonus. Depth perspective, though no match for that of the Sonus, is very good for a moving-coil and much better than that of the Supex. The extreme high end is a little soft. The only really significant flaw here is tracking ability. With its extremely low compliance ( $5 \times 10^{-6}$  cm/dyne), high mass (8.5 grams) and spherical stylus, the Denon does not track very well. Recommended tracking force is 2.5 grams, and at that weight one can only wonder at what damage might be occurring to one's discs. At least, when it does mistrack, it does so inconspicuously, unlike the Sonus. This cartridge is well made (originally developed for FM radio broadcasting in Japan), sounds beautiful, sweet and warm, and is more listenable over the long run than any other I've heard. I've just ordered another one, so that I won't be without one when I have to get my stylus redone.

Denon DL-103S (Shibata stylus). I auditioned this one only for a brief period. It is Denon's attempt at a higher-compliance, lower-mass DL-103, suitable for CD-4 reproduction. In most respects they have succeeded. The 103S is very light for a moving-coil cartridge (7.8 grams), tracks excellently at 1.8 grams, and has slightly increased compliance, though still very low by current standards. The stylus shape is not unlike the Shibata, though it does not unduly emphasize surface noise, as does the Sonus Blue. Tracking is superb despite the low compliance. I believe this is because of the shape and polish of the tiny diamond -- one of the smallest styli I've ever seen, whose lower tip mass is a contributing factor. Though I used the 103S only for stereo reproduction, response is claimed to be flat to 60 kHz, and I believe it. Transient response is on par with that of the Supex; the low end is clean and tight. Definition is also first-rate. This cartridge's downfall is its high end. While not quite as "ringy" as that of the Supex, the top end of the Denon has a distinct "bite" to it, especially when compared to the conical. As a result, the superb, natural balance of the conical is not maintained. This is a shame, as in most other respects the DL-103S is a better cartridge. My preference remains with the conical, though I highly recommend this one, particularly if you have a CD-4 system, or one that is soft or reticent on top.

Incidentally, an excellent source for Denon products is F&R Audio Imports at P.O. Box 212, Somerset, NJ 08873. The owners are very friendly and helpful, and they have the lowest prices for the two Denon cartridges I know of (DL-103, \$135; DL-103S, \$170). They also deal in Decca products.

-- Bill Feldman (New York)

## Magnepan MG-II Loudspeaker

The MG-II is Magnepan's updated version of the 2167 single-panel magneplanar loudspeaker. It is in many ways an excellent speaker and, at \$625 per pair, an outstanding value. I bought my MG-II's used about ten months ago for \$475, which I consider even more of a bargain, as the bass response improves with use.

To get the best sound from the Magnepan's, you must place them at least three feet from the wall. When properly positioned, they project very cleanly defined sound with excellent depth, detailing and transient response and little or no phase distortion. They lack very deep bass (below 60-70 Hz), but they might surprise you with what they do have. The high end is also very good but not particularly extended (beyond about 12 kHz). The speaker does not have the crystal clear sound of an electrostatic, but it does not have their sometimes bright or metallic sound or resulting listener fatigue, either.

They are very hard to fault throughout most of the audible range. They are detailed, with very low distortion and extremely clean sound. There is a slight midrange resonance that makes voices slightly less romantic and lush-sounding than they would be on some other speakers. Some people will react more than others to this coloration.

The Magnepan's provide a very large sound stage, which is both wide and deep. This makes symphonic works sound magnificent. They will not play really loudly (over 100 dB) without the sound becoming strained (perhaps because of their inefficiency). Here again, though, they might surprise you with how loud they can sound with very clean source material. Do plan on using an amplifier that will put out at least 100 watts per channel. My Dynaco ST-410 will put out almost 300 watts per channel into their 6-Ohm load. At times I use every last watt.

Because of their price and quality, the Magnepan's are a natural competitor for the Dahlquists, so I think a few words comparing them are in order. The Magnepan's cost \$175 less than the Dahlquists. The Magnepan's sound is more up-front than that of the DQ-10's. This and the Magnepan's wider stage lead me to feel that they sound better on large works, while the Dahlquists are just a shade more realistic on small works. The Dahlquists show a little more ambience and, perhaps, a little more air around instruments. They also go a shade lower in the bass. The Magnepan's bass has more depth and is slightly more detailed (especially in the mid-bass). On the high end, the DQ-10's are more extended, but they are also directional in the upper octave. The transient response of the Magnepan's is better to my ears (because of the very low mass radiators). Ultimately, the only way to decide is to compare them yourself.

In conclusion, the Magnepan's are an excellent value for money. They do have a few drawbacks, but the plusses far outweigh the minuses. The Magnepan is a very accurate and easy-to-listen-to speaker that some consider (when a subwoofer is added) a contender for (dare I say it?) state-of-the-art.

By the way, some say that double Magnepan's are doubly good; providing more extended bass and treble and higher volumes, at a bargain price of \$1250. Be careful about the 3-Ohm load, though.

-- Brad McCoy (Ohio)

## The dbx 157

As a fortunate individual who has permission to record several symphony orchestras (one of them very good) and some pipe organists, I have tried for many years to make the finest, most natural recordings possible. Although I use the best recording equipment available (Crown recorders, Neumann, Sony and Vega/Synchron microphones), noise has always been a problem. I used Dolby B for some time but was aware of some problems it introduced into the sound under certain circumstances. The problems noted are not evident when recording commercial discs and tapes, because they are all compressed to a substantial degree and lack creaking chairs and other audience noises. When the Dolby is used in live recording with an uncompressed signal, on extremely quiet passages any sharp transient will cause the circuits to "open" to let the transient through. They will not "close" fast enough for the transient to mask the tape hiss that comes through with the transient, however. The effect can be described as "breathing." My unit had both its Dolby level and internal tracking adjustments carefully tweaked as advised by the factory. It tracked beautifully and had

very good frequency response, but the circuits (in my opinion) are simply not fast enough to handle signals of 80 dB dynamic range. This breathing is, in fact, rather subtle. However, it certainly is audible to any critical listener who listens at 100 dB, concert-hall "row-A" levels. It is easiest to hear over electrostatic headphones (the audio magnifying glass). Transients that will cause the problem are such things as the conductor tapping his stand with a baton, the drop of a coin or key, a cough, etc. The most annoying situation in which this happens is that of a soprano singing solo. Each time she hits a sharp consonant it will trigger the circuit. Usually she is towards one side of the stage and, therefore, is picked up more strongly in one channel. The circuits in the stronger channel then operate more than those of the weaker, and this causes an apparent shift in the sound image, as the hiss rises on one side more than the other. To add insult to injury, the consonant tends to reverberate about the hall a bit and triggers the circuits several times. Needless to say, this is not exactly an accurate reproduction of what is going on, and ones illusion of reality is disturbed when listening to such aberrations in the reproduction chain. The effect happens in a fraction of a second, and most listeners don't notice it, but it is there, and it cannot be corrected by adjustment of the circuits.

Between breathing, a slight masking effect, and the basic limitation of only reducing apparent hiss by 10 dB, you can see why I was looking for something better than Dolby B. I should mention, however, that I have not regretted using the Dolby, as it was the only thing available in 1969, and its use resulted in a considerable reduction of noise on my tapes. I feel that the reduction in hiss is more important than some of these subtle problems, which only occasionally occur.

I obtained a dbx 157 after the very favorable review of the unit in Stereophile. The thought that I could almost double the dynamic range of my recorder without any aberrations thrown into the sound was hard to believe. Furthermore, I did not see how the dbx, which works across the entire audio bandwidth, could possibly operate without breathing. Before using it I did some frequency response testing with my tape deck in the circuit and found that the dbx effectively doubles the frequency response errors of your recorder. I had to completely align my recorder for the flattest possible response in the midrange-to-high-frequency region.

So, off to the concert and what did I find? It didn't seem to do anything bad to the sound, and it was very clear. However, I found that the noise was only slightly reduced over what was available with the Dolby. I had to design and build some new microphone preamps using the LM381AN ultra-low-noise IC, as the stock Crown units seemed to be the next limiting factor.

The next concert was different. I found complete silence, utter clarity, and absolutely no pumping, breathing, distortion, or any other type of sonic abnormality. Print-through, crosstalk and hum were totally absent. Furthermore, the large amount of compression while recording makes it very easy to set levels, as you now have great amounts of headroom, with the meters never slamming into the pegs or dropping to the end of the scale. No level matching is required, either.

I do find it hard to believe that the thing is capable of perfection, particularly since dbx admits that on certain types of very clear signals tape asperity noise cannot be removed, because the noise is in the same frequency range as the signal. Well, I have recorded many concerts and have yet to hear any kind of error in the unit. Solo flute and solo voice should provide good test signals, but I have yet to hear any problems. Perhaps it is partly because I only use the very best tape (Maxell UD-35), which has a mirror-like surface and no dropouts.

I have spoken with others who have used both the dbx 157 and the dbx 122. One individual who uses the former is actually using the professional stuff, which employs the same circuitry but has matching transformers and other features that the consumer series does not. He notes that dropouts through a dbx are much worse than without it in the circuit. The 122 is owned by an engineer in England. He claims that although the 157 is better in theory, since the 122 sounds just as good in an A-B test, has the ability to decode dbx-encoded discs and is much less costly, it is the better unit to have.

In summary, I can only say that the dbx 157 will convert your tape deck to total silence, and that it will do this with no degradation of sound that I can detect. I cannot believe that I can recommend this component as being "perfect," because I have never said it about any other component I have heard. Once you have heard what the dbx will do to a master tape, however, you will have no doubt that the results are truly spectacular.

-- Roger Sanders (California)

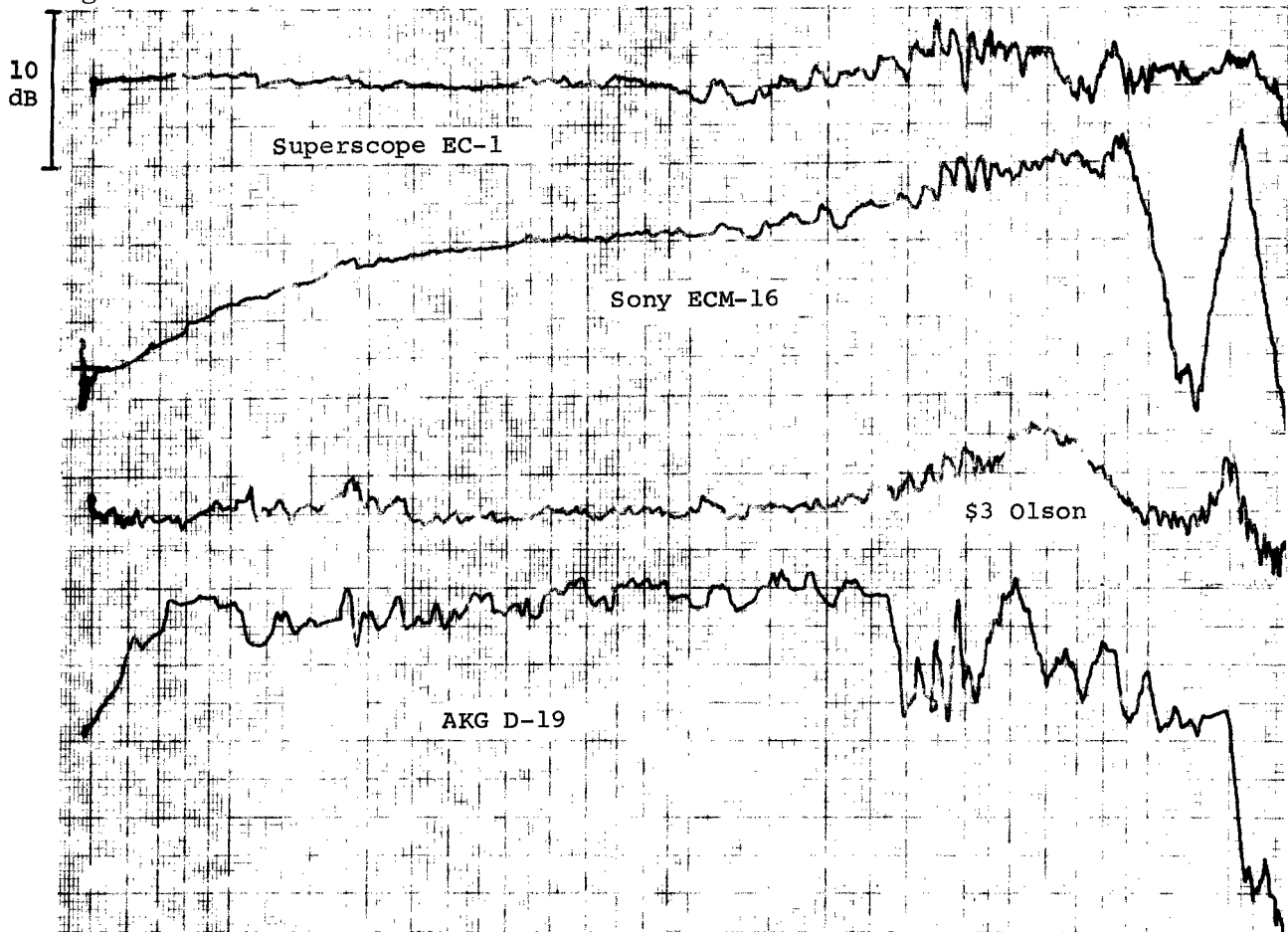
## More Equipment Observations

The impassioned plea of the Audio Society for material has moved me to write a note on a few audio products: the Superscope EC-1 electret microphone, the Pioneer TX-6500 tuner, and various cassette machines. It has only been possible to test one sample of each of these devices, so the reader should treat these remarks as enlightening but not definitive.

### Superscope EC-1 Mike

Let's start with the simplest. I was recently asked to repair a Superscope EC-1 omnidirectional electret condenser microphone and took the time to test the frequency response. The results were unusually good. My test method plots the difference in decibels between a reference B&K 4133 and the test microphone as a frequency sweep is played. The frequency response graph which results has a large number of small wiggles caused by reflections in the room where the measurements were made, but the major features accurately reflect the response of the microphone. The same method is used by AKG and other manufacturers to test their microphones, but they run their recorders fast enough to miss the small wiggles. The microphone turns out to be very good. There is a slight (1 dB) dip in the response at 1 kHz and a 2.5 dB rise at 4 kHz. The rise is common to many popular (and expensive) microphones and could be removed with a simple filter if it were objectionable. I did not have a chance to measure the noise of this microphone, but the output was quite low. The noise is probably similar to that of the well known Thermo Electron 914. I would like to test a few more of these microphones before declaring them a boon to mankind, but they look promising.

Several other response curves are given as comparisons. The \$3 Olson capsule is not so bad. The ECM 16 has a very unusual response for a condenser but would undoubtedly be good for tie-tack use. I wouldn't use the AKG D-19 for anything, and I have tried. Frequency response measurements do not always detect a poor microphone, but the ragged response in the 3000 Hz region is a sign of trouble.





## Cassette Recorders

A large order for "high-quality cassette copies" forced me to cope with the problems of cassette recording. I borrowed a new Advent 201A and a Dokoder for the job and began by comparing them to a Sony deck I had previously rebuilt to use Nakamichi equalization. As should come as no surprise by now, a tape made on any of these machines sounded unacceptable on any of the others. Surprisingly, it wasn't just the differences in equalization that were important. The heads of the three machines were positioned differently relative to the cassette housing, and the tape guides were also dissimilarly adjusted. The height of the cassette head turns out to be critical in making a high-quality tape. There is a tape guide built into the side of a cassette head, which pushes the tape into position when the head is engaged. The pressure pad will keep the tape in whatever position the guide happens to push it. Unless the height of the head and the guide is very close to the natural path of the tape in the cassette, the tape will take a different position on the head each time the machine is started.

This problem was quite severe on the Sony. The height of the head is usually not adjustable on these machines, but with patience and a little bending it was possible to make the Sony perform much more consistently. I made this adjustment by closely watching the tape move as the heads were pushed in. Once the height was right, the guide had to be adjusted. The best way to adjust the guide is by recording a tone and then making the magnetic path visible with "Magna See," the colloidal iron used to nail a former President. However, you can also paint a very thin layer of ink on the head and see how the tape wears it off. The lowest track on the tape should be almost touching the edge. If you have a standard tape you think you can trust, you can adjust the guide for maximum output on the VU meter. It is a good idea to push the tape up and down with a toothpick to see that the guide is correctly centered. The Sony, an inexpensive domestic model not available in this country, was originally quite poorly adjusted in this respect. The Sony would produce tapes compatible with the other machines only after adjusting the head and the guide.

I later checked a Kenwood machine belonging to a friend and found that one of my frequency response tapes played very strangely. One channel was consistent with the 150  $\mu$ s equalization used in that machine, but the other track had very little treble response at all. The problem seemed to be that the spacing between the two stereo channels on that head was different from that of the other machines. One track matched the test tape pretty well, and the other either missed the track or had a different azimuth.

The conclusion: Cassette machines are hard on the professional. The very narrow track width makes adjustment difficult both for the user and for the factory. After adjustment and equalization, tapes copied on these machines sounded reasonably close to the original. However, if I listened for more than a few minutes to the cassette, I started hearing very bothersome things. A massed chorus simply cannot be recorded anywhere near proper levels without noticeable high frequency saturation (self-erasure). Considerable impact is lost. The added modulation noise gives the tape a fuzzy quality, and the stereo images are not as stable as they are on larger formats. (I think the slight wandering of the very narrow tape tracks over the head is responsible.) Wow is audible on some material. In spite of reports to the contrary, cassettes cannot yet replace 1/2 track 15 ips Dolby A machines for master recording, and I much prefer ordinary 1/4 track machines running at 7 1/2 ips for general enjoyment.

Of the four machines tested, the Advent was by far the best. Using TDK SA tape, the response was ruler flat to 13 kHz, and the subjective quality on non-demanding material was excellent. Alignment was very good.

## Two Tuners

One seldom gets a chance to compare two tuners with an A-B test where the levels have been properly matched. However, the "Adventures in Sound" broadcast of the St. Matthew Passion allowed me to A -B a Pioneer TX-6500 and an AR. Levels were carefully adjusted, and a small panel of friends made the judgments. After about fifteen minutes of switching back and forth, we all agreed they sounded identical, or at least less different than the difference in the sound caused by moving ones head an inch or so. Both were equally "clear," and both were equally "transparent" (whatever that might mean).

I had previously touched up the RF alignment of the Pioneer, as I had to the AR several years ago. Both needed it. RF alignment is quite simple. For those who have never done it, here is some general advice. RF alignment can be improved (assuming it is already reasonably close to correct) by turning the little screws on the main tuning capacitor. You should first mark the position of each screw. You will not have to turn them very far. There are usually several screws on the tuning capacitor. The ones over the sections with many plates are for the AM tuner and should not be changed. One of the screws above the thin capacitor sections usually affects tuning and should not be changed. The Pioneer has four screws, two for AM and two for FM. You should adjust both FM screws, which interact slightly. Alternately adjust each screw while slightly changing the tuning, searching for lowest noise on a weak station close to the one you usually listen to.

Once the Pioneer had been adjusted it was as sensitive as the AR but not quite as selective. SCA noise on WCRB was noticeable but reasonably low. (RF alignment made this noise lower.) All in all, I think the Pioneer is a very good buy -- especially to someone willing to use a screwdriver.

Etc.

Bravo to Mark Davis for his excellent "Shop Talk" presentation of his work with phono preamps. The important point seems to be that phono preamps do sound different, and these differences can be important to the listening pleasure of some people. However, the differences almost always result from small differences in the frequency response. Any preamp can be made to sound like any other through small changes in the RIAA equalization network or the input capacitance.

-- David Griesinger (Massachusetts)

## Record Reviews

### Sheffield Lab 5: Likes It

Those nice people at Sheffield have done it with their Lab 5, a record that is technically nigh-on perfect. The record is virtually noiseless, and the dynamic range is what we expect of Sheffield -- almost the real thing. It is also a musical joy to listen to. Dave Grusin's name is new to me, though his credentials are certainly impressive; he is a superb artist on the keyboard. The performance is wonderfully intense, yet easy and flowing. By comparison, Missing Link was almost frantic and a little sloppy. Grusin's variation on "Git Along Little Dogies" is perhaps the best performance on this disc. His artistry and that of his associates make this "demo" record a musical temptation as well. You needn't buy this record to make your playback system prove anything.

The modulation levels are amazing; I thought I could see several places where grooves appeared to overlap their neighbors. Bill Schnee cut it close here and got away with it. One wonders if pickups of ten to fifteen years ago could have played this disc properly, if at all. The instructions on the jacket for setting up optimum playback are curious: they suggest reversing the polarities of both pairs of speaker leads. What's the difference? I couldn't hear any. My only quibble is with the imaging. It is not as good as that on some other records I have heard, but the clarity, dynamic range and sheer musicianship more than make up for it.

If Sheffield can continue to put together technical and musical excellence such as this, a lot of people will be happy to pay extra for it. Perhaps we can have some classical music for full orchestra. How about it, guys?

-- Damon Hill (Georgia)

### Sheffield Lab 5: Doesn't Like It

I don't like the multiple-mono Sheffield Lab 5. Sheffield has resorted to phony ambience, close miking and an odd sense of spaciousness that surrounds the performers. The bass is entirely too heavy and unnatural. Reversing the polarity of only one speaker does help tame the bass, but this should not be necessary in a quality recording. The instruments are excessively bright and occasionally too hard and piercing.

-- Alvin Foster (Massachusetts)

## Some Capsule Rock Recommendations

Since I don't see too much mention of rock (I hate to call it that) in the Speaker, I thought I would send along a list of a few of my favorites. I listen to classical, too, but feel that many other members have a far greater knowledge in this area than I.

Gryphon: Midnight Mushroom/Transatlantic TRA 282  
Raindance/Transatlantic TRA 302  
-- Light classical-rock with lots of bassoon! Good sound.

Curved Air: Air Cut/Warner Bros. K46224  
-- A little bright, but good, especially one cut: "Metamorphosis."

Orleans II/ABC 5C 062-96627  
-- Good sound with several good songs.

Shawn Phillips: Second Contribution/A & M SP4282  
-- Excellent album, great voice.

Renaissance: Ashes are Burning/Sovereign ST-11216  
Prologue /Capitol S MA S -1116  
Turn of the Cards/Sire SAS7502  
Scheherazade (and other stories)/Sire SASD-7510  
-- This is one of my favorite groups. The music is classical-rock with lots of beautiful piano and a female voice that will knock you out (Annie Haslam). Sound is only okay.

Steeleye Span: Commoner's Crown/Chrysalis CHR 1071  
-- Good British folk group with great sound.

Triumvirat: Spartacus/Capitol ST11392  
-- German group with lots of synthesizer. Very good sound.

Strawbs: Hero and Heroine/A & M SP 3607  
-- Nice album; okay sound.

Al Stewart: Past, Present & Future/Janus JLS 3063  
-- This is an excellent album by a British folk singer who is just now getting popular.

Rick Wakeman: Six Wives of Henry VIII/A & M SP4361  
-- Nice organ and piano; good sound.

### All of the Moody Blues Albums

-- I had to mention them. Sound is only fair, but they have a lot to say. Excellent!

I also have not seen much mention of the Fulton discs in the Speaker, aside from Al Foster's mention of one of them as being good for preamp testing. They are, simply stated, unbelievable, especially:

Robbinsdale High School: Spring Band Concert/ARK 5136-S  
Robbinsdale Senior H.S. : Spring Band Concert/ARK 5112-S  
Armstrong H.S. Choirs: 1971-72 ARK 41872-S  
Edward Berryman: Organ Music from Westminster/ARK 10251-S  
North Park Elementary Choirs/ARK 4185-S

## **In the Literature**

When we originally started this feature it had a specific and restricted purpose: to call to your attention those articles of special merit and interest appearing in journals which you might not ordinarily encounter. We excluded articles by incompetent authors, as well as articles containing only mundane information or misinformation, and, of course, we omitted the large-circulation slicks, such as Stereo Review and High Fidelity, on the assumption that everyone reads them. With the passage of time, as various members have taken responsibility for the column, its nature has evolved; it has tended to become a comprehensive catalog of audio-related article titles, without regard for the merit of the articles or the locale of their publication (although we haven't had the manpower to make it absolutely comprehensive).

What direction should this column take? Would you like it to be a thorough listing of all of the audio-oriented articles which are published from month to month -- leaving it to you to read the ones which sound interesting and decide for yourself whether they have any merit? In this case, should we make an effort to make the lists absolutely comprehensive? Or, on the other hand, should "In the Literature" be a column of recommendations, listing only those articles which we believe to be of genuine value to audiophiles? In this case, is a list of titles sufficient; or, since many articles are in journals to which you may not have convenient access, should we make an effort to summarize in a few sentences the essential content of each recommended article? And to what extent should we editorialize, i.e., make known our opinions on the content?

Your views are solicited. What follows is an attempt to fulfill both of the above objectives -- too large a job to be accomplished on a regular monthly basis. -- Peter Mitchell (Massachusetts)

### Audio, June 1977

- \*E. T. Canby raises some fascinating questions about the physics of the early Edison cylinders (p. 8).
- \*An important discussion by Joe Grado of how the mechanical construction of the turntable can affect sound quality (p. 36).
- \*Iron Curtain Records: a discussion of some Eastern European labels (p. 44).
- \*Perception and Geometry: Richard Heyser tries to explain his "geometric" approach to linking subjective perception and objective analysis, in which his method is to "model perception with gestalt and use abstract geometry to analyze gestalt." The article turns out to be an exploration of the meaning of the Fourier transform and a discourse on the inadequacy of notions such as "frequency" as representations of what we hear (p. 52).
- \*Equipment reviews: Scott R-376 receiver, Hartley Zodiac 76 speaker, Technics 1350 turntable, SAE 5000 impulse noise suppressor, Yamaha CR-2020 receiver, Pickering XSV-3000 pickup, and Advent 300 receiver. The review of the SAE 5000 raves about the unit's ability to filter out a large gouge in a disc made with a knife but fails to note or criticize the unit's failure (despite SAE's advertising) to remove the ordinary clicks and pops which populate records (p. 64).
- \*European records: John Wright returns with his excellent quarterly column on pressings available by mail from England (p. 133).

### Audio Equipment Profiles

A compilation of 26 reviews from past issues of Audio, plus an updated version of the large table of specs on about 2,200 audio components which was printed in the October 1976 issue of Audio. Perhaps a useful reference volume if you do not have a file of the past year's issues of the magazine.

### Absolute Sound, No. 9 (Spring 1977)

Another large, 130-page issue. Full-length reviews of: Audio Research solid-state SP-4 and C-100 (unenthusiastic); Infinity FET preamp (rated on a par with the Levinson JC-2 as the best preamp); Van Alstine Double Dyna 400 (mostly favorable: superb bass, imperfect top); Yamaha C-1 and C-2 (good but not great); Grado Signature pickup (a mixed review); and Ampzilla II (an enthusiastic rave). Shorter reviews of the Fulton J-Modular ("a problematic speaker"); Kenwood KD-500 turntable ("the greatest value in turntables today"); Yamaha B-2 (mostly enthusiastic);

Hegeman Input Probe (mixed); Dahlquist LP-1 crossover and DQ-1W sub-woofer (woofer okay, crossover great); and Infinity Black Widow tone arm (an enthusiastic rave). Capsule reviews of the AGI 511 preamp (good), Fidelity Research Mk-III pickup (bad), Dyna 410 amp ("a genuine bargain"), Celestion UL-6 speaker (decent but overpriced), Stax UA-7 arm (unsatisfactory), Janis W-1 subwoofer (excellent in the 30-45 Hz range), Yamaha HP-1 headphone ("the finest headphone value today"), Sony MX-20 ("a stunningly good little \$2000 mixer"), Empire 2000Z pickup (grainy and aggressive), Bozak 929 amp (nice but not great), Van Alstine Dyna FET-5/II preamp (excellent, but is it consistent?), Goldring 900SE pickup (a mixed review), Koss Pro-4AA headphone (recommended for on-location recordists), ReVox A-700 (very good), Luxman PD-121 turntable (not recommended), and Stax 12S preamp (good but not state-of-the-art). Also an extended discussion of the updated Acoustat X electrostatic (a superb system with some frustrating limitations). PHD comments on the floor-mounted Hartley 24-inch woofer (terrific), the Netronics and Audio-Technica turntable isolators (highly recommended), and the Heath 1640 kit amp (good at the price with superb meters and a great bass end, but otherwise not state-of-the-art). As promised, the magazine is devoting increased space to searching for good-sounding records, both domestic and foreign. This issue includes advice on buying European discs and an excellent, surprisingly frank interview with the president of Desmar Records, one of several new and excellent American labels.

### Audio Amateur, 1977/2

\*A big issue, 80 pages long. This consistently interesting journal for experimenters is now in its seventh year.

\*Slewing Induced Distortion: The second installment in Walter Jung's crucially important and revealing exploration of the sources of high-frequency distortion in audio circuits. This installment is mostly about ICs and about the use of THD and IM distortion tests to reveal SID (p. 22).

\*Construction projects: how to make your own electrostatic speaker (p. 4), your own Heil air-motion transformer (p. 15), and a modification of the AR turntable to accept the Decca (or other) tonearm (p. 10).

\*Transient response: A spottily provocative essay by tube enthusiast H. L. Eisenson, unfortunately contaminated by misinformation and sloppy thinking (p. 12).

\*Kit Report: on the assembly and measured performance of the Dyna Stereo 400 and the Van Alstine Double Dyna 400, plus Walter Jung's subjective comparison of both versus the Heath 1640 and GAS Ampzilla, concluding that the Ampzilla is the best of the four with the Heath 1640 second (the speakers used for the test were Magnepan MG-II). Incidentally, Jung notes that owners of the Stereo 400 can get most of the parts and information for doing the Double Dyna conversion directly from Dyna; request their data sheet on the Stereo 416 conversion. Jung finds the Double Dyna a significant improvement over the stock Stereo 400.

### The Audio Critic, Vol. 1 No. 2, March/April 1977

Its \$28/year subscription price is a bit steep, but this magazine continues to be interesting -- in part because its editors seem to be honestly interested in finding correlations between measurements and sound. Issue #2 opens with an admission of failure to find a quantitative test which correlates with the audible differences that they claim to hear among preamps. Reviews and updatings on phono preamps and pre-preamps include the AGI 511 ("an outstanding value"), the Bravura (bad), the DB pre-preamp (good), the Hegeman Input Probe (good), the new version of the Levinson JC-2 (the world's finest preamp), the Paragon 12 (very good), the Rappaport with MC-1 pre-preamp (second only to the JC-2), the Supex step-up transformer (poor), and Mitchell Cotter's Verion transformer (superb). A full-page letter from Mitch Cotter summarizes his BAS talk; we hear that Cotter will become a technical consultant to the Audio Critic, which bodes well for the magazine's subscribers. Producer Max Wilcox contributes a provocative essay on concert hall acoustics, recordings, and how our eyes prejudice what we think we are hearing at live concerts. The issue continues with the first installment of a series of reviews of power amps (Audio Research D-100, CM-912A, Electrocompaniet, Futterman H-3aa, GAS Son of Ampzilla, Luxman M-4000, Quad 405, Quatre 250, SAE 2400L, and Yamaha B-2; Quatre identified as best of group). Finally subwoofers are looked at, both in a delightful essay on the basic elements of woofer design and in a review which concludes that the Janis and Dahlquist sub-woofers are not entirely satisfactory but that the Dahlquist LP-1 woofer crossover is terrific.

Boston Phoenix, May 3, 1977

This issue contains the quarterly, 80-page "Sound Ideas" audio supplement, two-thirds of it written by BAS members. Subjects of its 18 articles include binaural sound, near-field speaker listening, record cleaning, car stereo, digital audio, examinations of the Bose and Yamaha factories, the first American review of an Elcaset recorder ("the superb Sony EL-7"), "Shop Talk," listening room acoustics, movie film sound, and a how-to-do-it piece about on-location concert recording. If you missed it, the issue can be obtained by mail for 50 cents from The Boston Phoenix, 100 Massachusetts Ave., Boston, MA 02115.

db, May 1977

- \*Microphones and Transients: on the impulse response of microphones (with Figures 6 and 7 apparently reversed) (p. 35).
- \*Low Frequency Sound Reproduction: useful equations and graphs relating cone diameter, cone motion, and acoustic output in the bass (p. 39).
- \*Noise of sources: a long overdue exploration of how the useful S/N ratio of preamps is limited by the impedance-related noise of the signal source itself, be it mike or phono pickup (p. 42). Some of the same material was also in a recent issue of Audio, as well as in National Semiconductor's Audio Handbook, not to mention The BAS Speaker a year ago.

EDN, April 5, 1977

- \*"Develop your own effective delay-distortion equalizer": Design an all-pass network to add (or subtract) phase shift in your system (p. 74).

EDN, May 5, 1977

- \*"Differential high-Z rms-dc converter has 0.1% accuracy" (p. 114).

Electronics, April 14, 1977

- \*"Four AM stereo techniques compete": One fallout may be wider bandwidth AM receivers yielding higher fidelity (p. 82).

Electronic Design, May 24, 1977

- \*AM Stereo: a comparative discussion of the four broadcast modulator systems the FCC is considering for imminent adoption as a standard for AM stereo (p. 28).
- \*Focus on Electronic Counters: a detailed survey of the virtues, features, and limitations of frequency counters (p. 54).
- \*Slew Rate: Walter Jung summarizes his on-going investigation of Slew-Induced Distortion (SID) in ICs and other circuits (p. 172).

Gramophone (England), February 1977

- \*Report from America: Harry Maynard discusses the Boston Audio Society (p. 1340).
- \*How do you Review?: commentary on the difficulties of reviewing (p. 1339).
- \*Reviews: Akai 1030 receiver, Garrard GT-55 turntable (evidently much improved over its predecessor, the Zero 100) (p. 1345).

Gramophone, March 1977

- \*Sounds in Retrospect: comment on the sound quality of recent releases (p. 1472).
- \*Reviews: Enthusiastic appraisals of the dbx 122, Dahlquist DQ-10, and Technics SP-10 Mk. II.

Hi-Fi Answers (England), April 1977

- \*In the Groove: John Wright's frank comments on the sound quality of various recent releases (p. 64).
- \*Talking Machines in the 19th Century: Enjoyable reading about early cylinder machines, with marvelous illustrations (p. 67).

### High Fidelity, June 1977

- \*Test Reports: Five loudspeaker reviews with response curves missing -- Cizek Model One (with notably low distortion and high power handling), Jennings Vector 1, Bertagni D-120, Koss Model 2, and Phase Linear III (p. 37).
- \*How to Interpret Loudspeaker Tests (p. 46).
- \*Loudspeakers Without Boxes: Peter Mitchell surveys flat-panel speaker designs (p. 50).
- \*The New Copyright Law: The background and implications of the new law; for instance, it requires that radio stations (even non-commercial ones) pay royalties on the records they play (p. 63).

### Hi-Fi News and Record Review, January 1977

- \*Interface: Angus McKenzie takes a revealing look at the important subject of how a speaker's reactive impedance alters the performance of an amplifier (p. 65).
- \*Hi-Fi in the Rising Sun: a survey of the October 1976 Tokyo hi-fi show (p. 55).
- \*Quality Monitor: assessing the sound quality of recent releases (p. 87).
- \*Reviews of the Rabco ST-7 and Accutrac 4000 turntables (p. 139).

### Hi-Fi News and Record Review, March 1977

- \*Amplifier Musicality: A discourse by a French/Japanese tube enthusiast, which begins with the reasonable notion that low-order harmonic distortion sounds different than high-order THD, but goes on to the bewildering conclusion that the subjective sound of an amplifier is imitative of the shape of its distortion spectrum! Thus, he says, the most musical-sounding amplifiers have relatively large distortion totals, with a distortion spectrum in which the harmonic overtones have a strength inversely proportional to their frequency; whereas an amplifier having lower THD and a distortion spectrum showing only lower-order harmonics will sound lacking in treble (p. 41).
- \*Disc Replay Amplifier: a phono preamp design using the LM381 IC (p. 47).
- \*Assessing the Performance of FM Tuners: part of a series on tuner testing (but no actual test data are given) (p. 55).
- \*Positive Feedback: letters on the amplifier/speaker interface, one making the sensible suggestion that amplifiers should be rated for voltage output rather than "power" output, and similarly that the efficiencies of speakers should be specified via a voltage sensitivity rating (p. 83).
- \*Reviews: the Sony EL-7 Elcaset (an enthusiastic rave), the JVC HM200E binaural microphone/headset, and assorted other headphones (p. 127).

### Hi-Fi News and Record Review, April 1977

- \*SME Damper: announcing a forthcoming damping accessory for SME arms; the photo reveals it to be uncomfortably similar to the Bob Graham BAS damper of two years ago (p. 63).
- \*Hi-Fi Recommendations: a survey of American "underground" hi-fi magazines, including the BAS Speaker (incorrectly described as being 16 pages long, instead of our standard 30 pages). Circulation estimates are given as follows: Sound Advice 5000; Absolute Sound 12,000; Stereo-ophile 8300; Audio Amateur 6000 (p. 69).
- \*Pickup Musicality: applying to phono cartridges the same silly theory used against amplifiers in the preceding issue (p. 79).
- \*Television Sound: describing some mostly unsatisfactory methods for picking sound out of a TV set and routing it to the stereo system (p. 83).
- \*Assessing the Performance of FM Tuners: Part 3 (p. 93).
- \*Quality Monitor: on the sound quality of recent records (p. 109).
- \*Reviews: Comparative tests of the Pioneer 1250 and Rotel 1603 super-receivers (p. 163).

### Hi-Fi News and Record Review, May 1977

- \*Cassette vs. Disc: Angus McKenzie makes nose-to-nose comparisons, including measurements of peak level, dynamic range, noise, etc; this is Part 1 of a promising series (p. 45).
- \*FM Radio: McKenzie reports some impressive binaural listening experiences (p. 77).
- \*Assessing the Performance of FM Tuners: Part 4 (p. 99).
- \*Reviews: very compact speakers (JR 149, Spendor SA1, Visonik "Little David;" Spendor clearly the best) (p. 147).

## International Audio Review, Nos. 1 & 2

This Sound Advice spinoff, which many had written off as a bad investment, is finally off the presses, a year late. And like SA before it, IAR is a fascinating departure from the norm of audiophile "journalism." Though they promise equipment reviews in future issues, this one (or two, if you will) covers the June 1976 CES Show. Of course, that's old hat, but IAR's coverage is not. They discuss in some detail the designs and design trade-offs, with an eye to educating the audiophile about why things work the way they do. Discussions range over amplifiers, TIM, power supplies (and their enormous importance), turntables, tone arms, etc. Their treatments of power supplies and of turntables are especially striking. One might quibble, however, with their tendency to lapse into speculation, especially as regards the value of 300 V/ $\mu$ s slew rates or of phase linearity, and with occasional instances of bad grammar. At the end, the editors give explicit instructions for beefing up the Phase Linear 400's power supply, which they claim markedly improves its sound. An interesting effort. Four issues for \$15 from IAR, Att Sub, 2449 Dwight Way, Berkeley, CA 94704.

## Journal of the Audio Engineering Society, April 1977

- \*"A Method for Measuring Transient Intermodulation Distortion, " Eero Leinonen, Matti Ojala and John Curl (p. 170).
- \*"Slewing Distortion in Digital-to-Analog Conversion, " (p. 178).
- \*"Localization of Lateral Phantom Sources:" Concludes that at least six speakers are required to achieve an omnidirectional sound stage from discrete quadrasonic signals without localization jumps (p. 196).

## Mr. Audio's Bimonthly, #2

The Trevor Lees preamp is widely reported to be a rip-off of the phono stage of the Paragon preamp; furthermore Lees manages to get audiophiles to pay \$12 to subscribe to what is, in essence, a promotional brochure for his products. At least his attitude is consistent; who else would have the gall to call himself "Mr. Audio?"

Fortunately, issue #2 is less outrageous than #1 was. While #1 consisted almost entirely of self-congratulatory descriptions of Lees' ideas, issue #2 mixes contributions from three outsiders with the promotional tissue. One expresses the view that added distortion is far more distracting than losses such as rolloffs; thus the simplest possible circuit (even if limited in bandwidth or power) is the best; also the view that the hardest thing to achieve in reproduced sound is the elusive character of the sound in the environment -- "the very shading of the air itself." That quote aside, the only thing in the magazine worth paying for is Ken Johnson's fine discussion of a dozen recommended recordings of Medieval and Renaissance music.

After publishing issue #2, Mr. Audio's Bimonthly appears to have died a well deserved death.

## Popular Electronics, June 1977

- \*Test reports on the Lafayette LR-3030 receiver and Technics SB-6000A linear-phase speaker (prior to which Hirsch professes his neutrality in the phase shift audibility controversy) (p. 30).
- \*"Creative Recording with 4-Channel Tape Recorders:" If you could use a 4-track machine as a multi-channel recorder, what would you do? (p. 73).

## Radio-Electronics, June 1977

- \*Test reports on the Sony EL-5 Elcaset tape deck and Sherwood HP-2000 integrated amplifier (p. 57).
- \*"Solving the dB Mystery:" The ubiquitous dB unmasked (p. 65).

## The Sensible Sound, Vol. 1 #2

This quarterly is devoted to price/performance ratio, but is rather skimpy itself. Reviews include Phase Linear 400 (good value), AKG 140 headphone ("without peer in its price class"), Shure M95ED (very good value), Decca Brush (good), Superelex PEP79E electrostatic headphone



(good at the price but not equal to Koss ESP9), Large Advent (outdated), Small Advent (too inefficient for small receivers), Marjen 1 speaker (poor value), Quatre BOD-1B preamp (good), Grafyx SP-10 speaker (a best buy), August Systems mod kit for Dyna PAS-3 (superb), Bigston 300 cassette deck (a best buy), Onkyo 4500 receiver (very good), DCM "Time Window" speaker (very good); plus brief looks at the Audio/Pulse One (exciting), Technics 677 cassette deck (good), Sennheiser 414 headphone (mediocre), and Hegeman Input Probe (uncertain).

#### Stereo Review, May 1977

- \*The Trouble With Dynamics: Ralph Hodges explores why a dynamic range exceeding 70 dB might not be welcome, even if it were practical (p. 24).
- \*Technical Talk: Julian Hirsch points out the important fact that inter-channel capacitance in turntable wiring can reduce high-frequency separation with many pickups (p. 30).
- \*Reviews: Aiwa 6500 cassette deck (astonishingly flat), Scott R336 receiver, Superex TRL-77 headphones, and Dyna 300 power amp (p. 31).
- \*RFI: a good basic guide for fighting CB or other radio interference; restricted to fixes which can be applied externally. (If you need to make an internal mod in a component, refer to the January Audio.) (p. 56.)
- \*A Beginner's Guide to Chamber Music: a good starter set, though no one will agree with all of Kolodin's recommendations (p. 70).

#### Stereo Review, June 1977

- \*Tape Talk: includes a scary note on what airport security scanners may do to recorded tapes (p. 35).
- \*Technical Talk: frank talk about FM tuner specs (p. 36).
- \*Equipment reports: Lafayette LR-9090 receiver (evidently very good), Thorens TD-126C (with the excellent Iso-track arm and better anti-feedback isolation than is usual for Thorens), Ohm L, Tandberg 330 cassette deck, and Sherwood HP 2000 amp (p. 37).
- \*How Much Distortion Can You Hear?: Paul Milner (a psychoacoustician formerly with CBS Labs and more recently at AR) reviews information on human-ear perception thresholds (p. 64).
- \*Herbert von Karajan: an interview with the Red Baron of the Berlin Philharmonic (p. 80).
- \*Note The Absolute Sound T-shirt worn by recording engineer Jerry Bruck (p. 90).

#### Stereophile, Spring 1977

- \*Equipment reports: Rogers/BBC LS3/5a speaker, Infinity headphones, Audio Research D-100 amplifier, Epicure Ten and Eleven speakers, Frankman speaker, E-V Sentry III speaker, Magnepan speaker, Sonus Blue cartridge, B&W DM-5 speaker, Audio Research SP-4 preamplifier, Dynaco Mk VI power amplifier, Infinity Black Widow tone arm, Formula 4 tone arm and Luxman 3045 mono power amplifier.
- \*"What Ever Happened to Weathers:" an interview with Paul Weathers.

#### Studio Sound (England), January 1977

- \*The Economics of Multitrack Recording: suggests that, despite a popular assumption, multi-track recording is remarkably uneconomic for the studio or record company (p. 30).
- \*Reference Levels: making sense of tape standards (p. 42).
- \*The Echo of Fashion: Professor Fellgett argues the case against multi-mike recording and in favor of the realism which is achievable with simple coincident-mike technique, i.e. , Blumlein method (p. 56).
- \*Review: the White 140 third-octave analyzer.

#### Studio Sound, March 1977

- \*A Question of Coincidence: why it may be pointless to cling rigidly to "purist" mike technique (p. 48).
- \*Reviews: Studer A68, Altec 9440A, and Dunlap Clarke 1000 power amps (p. 68).

## Studio Sound, April 1977

\*Survey: Time Delay and Reverberation units (p. 26).

\*Interconnection: some oft-neglected matters of equipment and technique, which are of value of amateur as well as professional studios (p. 32).

\*Quadrafile: on the engineering of what may be the crucial test record for quadrasonic enthusiasts -- a two-disc set with identical music on each of the four sides, recorded respectively in SQ, QS, CD-4, and UD-4 quad; price: \$17.50 ppd. from Hi-Fi News and Record Review, Link House, Dingwall Avenue, Croydon CR9 2TA, England (p. 46).

\*Reviews: EMT 250, Denon 2000 and Quad/Eight RV19 reverb systems (p. 52).

-- Peter Mitchell, John Schlafer, Michael Riggs

## **May BAS Meeting**

The May meeting was held on Monday the 16<sup>th</sup> at the Acoustic Research plant in Norwood. The usual array of goodies was offered for sale, such as TDK and Maxell tape and a batch of Ampex 632 and 642 tape which Scott Kent had got hold of. Bruce Maier's quest for Cleveland Orchestra direct-to-disc records at a reduced price (\$8 or so) is complete; see last month's Speaker for further details, and see Max Wilcox's comment on the disc in the following meeting summary. Brian Leeming promised a splurge of record-buying in June; get your orders ready.

SME, after sending us a somewhat testy letter about the futility of tonearm damping, is bringing out a damping device that looks as if it is built to Bob Graham's specifications. Perhaps he should send them a bill for consulting services. Anyway, we get the last laugh twice, as BAS member John Tooley has promised us SME dampers from England at about half price.

BAS telephone directories are now available. We have a new commuter service chief in Tom Hahs. My BAS directory says his number is 742-2568, so get in touch with him if you need a ride to GTE-Sylvania.

Yes, folks, GTE time is here again. It seems that of all the groups that used to use the facility, we (and especially member John Schlafer) took by far the best care to leave it clean, and GTE has decided to lend it to us free, instead of charging \$60 per evening. Needless to say, but let's say it anyway: keep up the good work, and straighten up a bit when you leave.

The final action of the business meeting was the election of C. Victor Campos to honorary life membership in the BAS, in consideration of long years of service to all the goals we hold so dear. Congratulations, Victor.

## Original Meeting Feature

The main attraction of this month's meeting was a live-versus-recorded demonstration staged especially for the BAS by Acoustic Research. This same demonstration had been done at CBS and at dealers' showrooms in Chicago and had fooled most people there, and people at AR were apparently curious to see whether they could do as well with the suave, golden-eared sophisticates of the BAS. Because of space limitations in the listening room, those present were cycled through the demonstration in several groups. Meanwhile, the rest were suitably entertained, about which more later.

The event's producer, Victor Campos, addressed some prefatory remarks to the entire group. He traced the history of previous LVR demos produced by Edgar Villchur at AR, which used a string quartet, a guitar with voice and an old nickelodeon. The present effort features percussionist Neil Grover playing a drum set consisting of a snare drum, two bongos, three toms of different pitches, a bass drum and four different cymbals (actually three single cymbals and one pair). Drums were chosen to test power handling and reproduction of very-high peak levels, which turned out to be around 130 dB in the rear field.

The recording was made in an anechoic chamber using two Schoeps "Colette" series microphones and two Bruel & Kjaer 4133's, which are half-inch measuring microphones with unusually

flat free-field on-axis response. Gately and Studer mixers were used, the Studer because of its high overload capability, and the mixer output was fed via Dolby A encoders to a Studer A80R tape recorder.

The tape used was Scotch 208. Brief attempts with other tapes were made, but none worked better, and most were inferior. A very expensive Agfa tape gave an unnatural low end and a distorted midrange. (According to Campos, recordings of bells are very revealing of midrange distortion.) Scotch 250 and Maxell UD failed for similar reasons. The cymbals didn't sound real on Scotch 206/207. Of the others that were tried, Scotch 202 and Ampex 406 did the best, i.e. , nearly as well as the 208.

The tapes we heard were the original masters; according to Campos even second-generation copies will not do. He suggested that the advantages of direct-to-disc recording might be much smaller if conventional records were not made with second- or higher-generation tapes, as is now almost universally the case. The peak-to-average ratio of the tape we heard was around 20 dB, greater than that found in all but a tiny fraction of available recordings,

The recording was played back on a Studer A67 recorder, feeding the Dolby decoding circuitry and a stock Dynaco PAT-5 preamp, whose balance and tone controls were used to make fine adjustments. A remote volume control, operated from front row center by Mr. Campos himself, was used to maintain the best possible level matching during the demonstration.

Two power amps were present; each was used during the course of the evening. One was a Dunlap Clarke Dreadnaught 1000, the other a Luxman 6000. These are the only two of many amps tried that will do the job. There were many failures, some occurring in as little as 10 seconds. Of the two adequate amplifiers, Campos prefers the Dunlap Clarke, primarily because, unlike the Luxman, it can be lifted without a crane. (Also, if you are the type to worry about a measly couple of thousand dollars, it costs less. -- EBM.)

And last but not least, the loudspeakers: a single pair of AR-10's. Two-way speakers do not have the power-handling ability required. Multiple-driver systems, such as the LST, don't work, apparently because of interference effects between drivers covering the same frequency range. The same problem exists when more than one pair of speakers is tried. So: a single pair of three-way systems, located on the wall behind the drummer, about four feet apart. These particular units had out-lived several amplifiers, and had been used for this demonstration about 150 times. Periodic checks of their frequency response and sensitivity have revealed no changes. One woofer was replaced after an amplifier died and sent a lot of DC through it, and an intermittent midrange switch was replaced. According to Campos, the longevity of the drivers under such arduous conditions is mostly due to the use of amps big enough not to clip seriously.

The demonstration took place in a room about 22x26 feet, which had three walls of plaster-board and one of glass, a shag rug, an acoustical tile ceiling about nine feet high and some sound-absorbent material on the wall behind the drummer. We heard a short section with drums alone, then the tape alone. We heard a section in which some instruments in the drum set were live and some on tape. Then we were asked to guess what was what in a forty-second segment. Before this segment began, we were asked to listen for any changes, as from live to tape or tape to live, and to try to tell how many seconds into the short segment the change occurred. The drummer flailed away; we listened and tried to look at our watches at the same time, and several people heard something change about half way through. I was certain that at least the snare drum had been recorded at the beginning and end and thought I might have heard some change in the middle, but wasn't sure. It turned out that the entire segment was taped and that the drummer hadn't been playing at all. We had been fooled as completely as other audiences had been, by what this listener felt to be a combination of two things. The first was a recording that was very close to the original. To my ears, the taped snare drum sounded boxy compared to the live one, and the recorded bass drum did not go as low or sound as solid as the real thing, but the recorded bongos, toms and cymbals were not distinguishable from the live ones from where I sat (about half way back). (Some noted a lack of extreme high frequency energy on, for example, high-hat. -- Ed.) The second important factor in the illusion was our having been told to look for changes and to consult watches to time the changes. All of this constitutes what in stage magic is called misdirection, a sort of mental judo, which is used to control perceptive powers rather than physical force. In this case, ones attention is focused on trying to discern changes where there are none and then

distracted even from that task by simultaneously attempting to read a watch dial and subtract the reading from the reading at the start of the selection. Add to this the fact that you were told at the outset that you were expected to be more discerning than the average listener, so that you might be worrying a bit about whether you really could hear better, and be anxious to do well, and the task becomes very complex indeed. Still, it would not have worked had the reproduced sound not been impressively close to the original. It was very close. The drummer illustrated some of the problems that arise in trying to duplicate the live sound. One was the change that occurs as the varnish wears off a new pair of drumsticks. He had about fifty pairs of the same model stick to use, but it was important to use them at about the same point in their lives. The difference between a used one and a new one was dramatic. Changing temperature and humidity cause changes in the pitch of a drum head, and this too creates an easily perceptible error between tape and live. And according to the technicians in the back of the room, the drummer had had almost no practice with this particular tape and was much better at fooling people with the one he knew well.

In his remarks following the demonstration, Campos said that one purpose of this exercise was to explode myths about the necessity for linear phase response, high efficiency and exotic tweeter designs. Phase is important and should be carefully considered in the design of cross-over networks, he said, but the whole concept of phase linearity has been overstressed. (Of course, if the woofer had better phase response, which also implies better frequency response, the bass drum might have sounded more real. And if the speakers had been more efficient, it wouldn't have been necessary to use such elaborate and expensive amplifiers. Still, you can't have everything, and it is particularly hard to have better bass and greater efficiency at the same time. Finally, the tweeters, while of conventional design, do have ferrofluid around their voice coils, and this may help substantially in prolonging their lives under these conditions. -- EBM) Victor Campos states, quite plausibly, that because the anechoic chamber is not actually anechoic below about 150 Hz, the bass drum was the only instrument not recorded anechoically, and that this is sufficient to destroy the illusion. All in all, the demonstration was a most impressive effort, and congratulations are due Mr. Grover, Mr. Campos and recording engineer John Newton.

### Additional Meeting Feature

While one group was testing its collective acumen in the demonstration room, all the others were being regaled with inside stories from the classical recording business by producer Max Wilcox. Mr. Wilcox currently produces recordings for five record companies, one of which is RCA, and one TV company, Unitel, which is responsible for the PBS Great Performances series. He has been Artur Rubinstein's personal producer since 1959 and had many interesting things to say about the old master. He is also an associate editor of The Audio Critic magazine. His presentation took the form of an informal colloquium with a frequently changing audience, which I will summarize by categories. (My thanks to Al Foster for note-taking during my absence. -- EBM)

Microphones and Miking. The microphones Wilcox praised most highly were two models. One is the so-called Cambridge ribbon microphone, for which the initial design work was done by Peter Bartok. It is now manufactured in small quantities by Charles Fisher of Framingham, Massachusetts, for about \$400. The other model is the Colette series Schoeps unit, the same one used to make the drum recording we heard, which he advised buying through Studer for about \$320. The Schoeps requires a 48 V power supply, not included in the above price. These two microphones sound quite similar, and he has used them together with good results. As a musician, Wilcox feels that having the individual instruments sound natural is one of his most important goals. He does not like the twenty-mike "multiple-mono" approach used in so many places, and particularly at Columbia Records, which he says is possessed by a "mania for clarity," but he points out that this technique is far more successful in the hands of someone like (producer) Andy Kasdan, who has really mastered it, than it is when practiced by less skillful individuals. Though a simple two-mike setup is a nice idea, it sometimes just doesn't suffice. If the balance isn't right the first time, there is no way to correct it later, and the more expensive the production, the more pressure there is to record things separately and balance them later. This of course means using more than two recording channels, too. He has on occasion used an original two-track master to cut a record (his recording of Benita Valente on Desmar records was done this way), but when he was doing the sound for the Great Performances films, which cost \$150,000 per program to produce, he had no choice but to record on sixteen tracks and mix down later. To pick up hall ambience, he favors using a pair of cardioid mikes pointed out at the hall from relatively close to

the instruments. He dislikes moving the principal stereo pair rearward just to include more hall sound. It is important, even when doing spot or accent miking, not to get too close to the instruments; the DGG recording of Pictures at an Exhibition with the Chicago Symphony under Giulini exhibits this error. The string section sounds like three violins instead of sixteen, and the percussion section seems to him to be about twenty feet in front of the rest of the players.

Record Production. One of Wilcox's main functions is that of ambassador between artist and recording company, or even between artist and artist. For example, it was Wilcox who persuaded Rubinstein to record with the Guarneri quartet. And when he told Ormandy that Solti had signed a contract with Unitel, it wasn't long before Ormandy signed with them, too. The producer must also cope with the mannerisms of musicians. String players like to breathe noisily as they begin to bow. The choice therefore comes during editing of whether to splice at the sniff or the note. He helped break Peter Serkin of the habit, apparently learned from his father Rudolf, of stomping noisily on the pedals (getting him to wear sneakers was the first step). The final balance of a recording is often strongly influenced by the artists, particularly in the case of Rubinstein, who he says is not really interested in hearing the orchestra at all in his concertos.

Wilcox had some interesting things to say about the record-pressing business, too. He strongly criticized RCA's pressings during the days when he worked mainly for them. At that time the producer had almost no control over that part of the chain. Still, although he has never heard a record of his that he didn't think could have been better done, he feels that very few have been ruined by bad pressings. He does not roll off the low end of his tapes, even though the Fisher and Schoeps mikes he uses have lots of low bass. Apparently most cutting lathes are set up to roll off below 50 Hz anyway. He likes the pressings made for Desmar by Teldec of Hamburg, which is also where Sheffield and the Direct from Cleveland records are done. He praised a Rachmaninoff Third Symphony done by Stokowski for Desmar, recorded with the Fisher ribbon mikes by David Hancock. He defended the use of peak limiting to prevent overload on instruments such as French horns and tympani, which sometimes give short, extreme levels which overload the cutter without sounding especially loud or dramatic. It is better to limit these peaks, he feels, than to allow them to dictate a reduction in level, and an increase in noise, for the entire remaining program.

In response to a question about four-channel sound, Wilcox said that he favored ambient quadraphony and that many of the Guarneri tapes he has made have two ambient channels sitting quietly beside the others. Unfortunately, this use of the extra channels is not dramatic enough for most record company decision-makers. Like many new developments, quad precipitated a battle between corporate giants. There was the battle between 33 and 45 rpm carried on by RCA and Columbia (which Columbia won), and the battle between the same two companies about color TV systems (which RCA won), and now the discrete-versus-matrixed battle (which it seems everyone has lost, including the consumer).

The direct-to-disc field is still expanding rapidly. Bert Whyte will be doing a DTD recording of the Boston Pops. Sheffield is building a truck to do DTD remote work. Wilcox has heard the Discwasher-Advent Cleveland Orchestra recording; he likes the sound of the hall very much, but does not feel the recording as a whole was well done.

The last part of the meeting saw a return to the podium of Victor Campos. This segment produced some pointed criticism of the golden-ear reviewers, principally those of The Absolute Sound. In particular, Campos feels that in trying to grade components by listening to records over them these reviewers are working without any real reference to the original sound, and he accused them of trying to play God by telling people what to buy. At this point, Max Wilcox stated that he has heard reviewers praising cartridges for revealing things that were never there in his recording. (Or were they? Mitchell Cotter seems to think that there are more things on our records than we are currently hearing. For those interested, Mr. Wilcox currently evaluates his recordings on AR-10n's. For an answer to the question of reference to live sound, see, for example, The Absolute Sound, Vol. 2, No. 6, p. 106, top of column 2. The fires of controversy rage on. -- EBM)

At the request of several other BAS members, I asked Max Wilcox a reporter-type question: What are your ten favorite recordings? (Actually, it was: "If you were to be stranded on a desert island with only ten records ... ") His reply was that he would choose recordings for their per-

formances, not for their technical quality: the Beethoven violin concerto done by Szigeti with Bruno Walter in 1932; Toscanini's Beethoven Seventh from 1936. When it was suggested that, since these were after all direct-to-disc recordings, he might be choosing them for technical reasons too, Wilcox responded by naming some recent ones of his own: the Schubert Fifth Symphony with the London Philharmonic under Sir Thomas Beecham, Rubinstein's Chopin Nocturnes and Mazurkas, and his Chopin First Piano Concerto, done under Skrowaczewski in 1961.

-- Brad Meyer