

2. Lowering impedance signal and supply wiring;

3. Placing film by-pass caps on supply lines;

4. Placing film caps for DC blocking at the output.

These modifications may have improved the sonic performance, but I'm not sure. If they did, they were to a small enough degree that I couldn't discern an obvious improvement. Maybe A/B testing of a modified versus unmodified player would have pointed out the difference.

Frankly, I've always been skeptical of these "improvements." They are so subtle, I cannot report they are truly worthwhile. Even though I've always wanted these mods to make a difference, I can't recommend them to anyone else, simply because I'm not sure they substantially improve the sonic performance of the modified unit. This is true despite the immense amount of time (and money) I've invested in modifying all types and vintages of audio equipment. I've seen a noticeable effect only in extreme cases (for example, old tube preamps and amps).

I followed your recommendations when I made the additional mods to the Sony circuit. Thanks to the servo circuit, I eliminated the output capacitor, and I replaced the four op amps (per channel) with high speed types (in my case, AD712s) in the output filtering/buffering section.

I noticed a slight improvement by using the servo circuit to eliminate the film output cap. Midrange was a little cleaner, and overall distortion was reduced (less smear and dirt). The second change, however, was a different story.

Replacing the stock Sony op amps with the two dual AD712s at the output netted a truly striking improvement. Although I avoid using exaggeration or overstatement in my audio judgments, I can't say enough about this improvement. The upper midrange-to-high frequency response was particularly impressive. String overtones and cymbals are much more natural, less harsh, and more three-dimensional. The entire frequency balance seems to have shifted to a more uniform one, and clarity is much improved.

Before this modification, I made comparisons between LP and CD sources. My LPs were almost always superior, with greater harmonic richness and a more natural sound than the same CD selection. The situation, however, has now reversed. I can now sense sonic problems with the LPs, and I wish they sounded as clean and undistorted as my CDs.

LPs still seem to extract more harmonic accuracy than the CD playback system, particularly from string instruments. This might be a form of additive harmonic distortion for LPs, but if so, it is still more musically natural and pleasing.

Regardless, I strongly recommend replacing the Sony op amps with the AD712 plug-compatible types. I hope others who try them perceive the same degree of improvement.

I am so enthusiastic about this modification, I'll give a set of four AD712C amps (mil-spec ceramics) to the first person who can recommend an equivalent, additional improvement to the Sony CDP-520ES, and justify the improvement through analytical hypothesis.

Mr. Jung replies:

One thing that troubles me is your apparent cool reaction to most of the other "standard" POOGIE changes. You describe their sonic impressions as so subtle you cannot be sure of their overall worth. While the distance between us prevents me from giving a quick answer, I can't let the matter slide. With the types of changes you mention, you should hear a difference.

I cannot say just how apparent they will or will not be, not knowing your environment, equipment, types of recording, and so on. But, given the proper framework, many others have reported noticeable differences with such changes. I tried to allow room for this in my article, but you can still explore some mitigating factors.

It really helps to be able to separate the types of sonic factors into various categories. For example, one of the biggest changes in sound, with regard to the op amp and its input dynamic range, lies in the ability to reproduce a realistic sense of the original acoustical space—an image with a high degree of depth and natural dynamics.

To put this in audiophile terms, the resulting sound would be more "open." This could be what you referred to as "more three-dimensional." If so, we are on a common wavelength. But, masking factors are going on all the time. Masking can be both major or minor in degree, and it can be due to either software or hardware. If, for example, you cannot routinely hear depth, it could be due to a lack of depth in the recording, or in the equipment (electronics or speakers).

Now, if you can hear an image with good depth and a sense of space from LPs but not CDs, this says to me your system can resolve these factors, but not

from the CD medium. To break it down further, make sure you are using a CD source with good depth (for example, those recordings mentioned in my article: Stravinsky's "Rite of Spring," Respighi's "Pines...Fountains...Festivals").

For such a test, you do not want to use a typical pop recording which features little or no natural space and depth (the ability to hear pan-potting is not what you look for here!). I don't mean to single out any particular aspect, I am just discussing something most of us can relate to easily. I also wish to illustrate the pitfalls as well as the logical inferences.

Regarding your servo comments, a servo is much better than most coupling caps, even the better ones. You do need to use the best available parts in it, such as polypropylene caps, and so on. Early trials with the TL op amp series showed they were an economical servo expedient. For your use, however, better sonics are available with other amps. Try one of your AD units for the servo and see for yourself.

As for the apparent lack of smoothness from CDs when compared to LPs, a variety of factors could be at work. The newest "DDD" CDs can be very taxing on the player, especially any which feature ancient instruments (they tend to sound brighter; ditto for massed female choruses, harpsichords, and so on).

Make some careful listening tests of a few analog mastered CDs (AAD or ADD), and you may find this a variable in terms of sound. Understand I'm not saying the all-digitals can't sound smooth, it simply takes much more work by the playback hardware. Some of this is detail work, but a lot if it is along the lines of what you are questioning. I simply cannot overemphasize just how critical it is to "fine tune" analog circuits for top-quality CD reproduction. Virtually everything counts, to a degree, unprecedented when compared with previous sources (including phono and FM).

CD'S PAIN AND PLEASURE

I APPLAUD THE 3/86 issue of *Audio Amateur* from cover to cover. It's one of the best issues I've seen. Also, congratulations to you (and to all of us) for adding Walt Jung as a contributing editor. Quite a coup for you, and a boon for the rest of us.

I was especially pleased with Mr. Jung's "Op Amp Meets CD," and Hampton Childress' article on modifying the Yamaha CD2 player. I hope Mr.