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What Makes Stereo Stereo?

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Communism is dehumanizing, because it is godless and soul-less. Materialism is a vital part of Marxism, and materialism, of course, denies God and the human soul. When God is denied, there is no one over the State to limit its power or to curb its excesses. If a man has no soul, he does not really differ from brute beasts. He can be tamed and trained, by some means or other, to jump through hoops, without thinking, at the crack of a whip.

Most of the many political prisoners whom I knew in China were *men*, quiet, but courageous and decent. There was a line which they would not cross, a depth to which they would not stoop, because they wanted to remain men. They would not abandon the hope, nor deny the right, of the mind of man to search for truth, and to state it honestly. They would not give up or deny the right of the will and heart of man to search for what is decent and good, and to defend it bravely. If we bought Communism, we would pay for it with a most precious birthright, our human dignity.

CHARLES J. MCCARTHY

What Makes Stereo Stereo?

The question is often asked: What is the difference between high-fidelity and stereo? The answer is that high-fidelity may be found in monophonic as well as in stereophonic sound and it simply means that the sound is a realistic reproduction of the original, or at least that the reproduction closely simulates the music heard in actual performance. Now this in detail implies that monophonic as well as stereophonic reproduction be free from noise. Or as the hi-fi jargon puts it: "There must be high signal-to-noise ratio." Then there must be conspicuous clarity undistorted by the hi-fi mechanism. Thirdly, the sounds of the highest and of the lowest pitch, together with their harmonics or overtones, must be heard. That implies that there should be a frequency response ranging from 30 to 15000 cycles and that this response be uniform or smooth throughout the whole range. Fourthly, high-fidelity requires that the range between the loudest and the softest sounds of a live performance be substantially retained. That means that the mechanism should be capable of producing these sounds without strain or distortion. It does not necessarily have to equal the intensity of the original, but there should be a reasonable approach to the original level.

Now to come to the characteristics of stereophonic sound that make it not different from monophonic sound but superior to it,

especially when the reproduced sound is that of an orchestra or chorus or even a smaller ensemble. First, in stereophonic sound there is the sense of direction in the sound as coming from the left or the center or the right; and also, especially so I would say, the sense of space as to depeth, that is, in front, half way back, all the way back.

How can we explain the directionality of stereo sound? There are at least four explanations. Remember that when one listens to stereophonic sound he listens to sounds coming from two loudspeakers separated by a considerable distance and that the sounds proceeding from the two speakers are somewhat different, since they were picked up originally by three microphones (on the discs the three sources are fused into two), each separated from the others at some distance. It happens then that there is a slight difference in the arrival time of the sound at each ear. It is enough for instance that the sound reach the listener's left ear a half millisecond before it reaches his right ear for his mind to conclude: "The sound is from the left."

Next, there is an intensity difference at each ear. A sound that strikes one ear at a certain intensity would strike the other ear at a different level of loudness. This difference helps the mind to determine the direction of the source of the sound. There is also an increase in the air pressure on the ear nearer to the source and a decrease on the ear away from the source. The higher the frequency of the sound the more notable is this difference in pressure, since the wave length of high notes is very short in comparison with the distance between one ear and the other. This is why the listener can more easily identify the direction of sounds with high frequencies than those of low frequency.

Thirdly, it is said that the differences of the wave form at each ear help account for the sense of directionality. The meaning of this is that while the ear nearer to the sound source and in the more direct path of the sound would pick up the fundamental sounds rich with their harmonics or overtones, the other ear, being shadowed by the head and not turned in the direction of the sound source, would not pick up all of the harmonics.

So far the reasons given point mainly to the lateral sense of direction. It remains to give a reason for the illusion of instruments arrayed in depth. We normally receive sound both directly from the source, that is, the instruments, and indirectly as the result of reflections from the walls or other surfaces and from the objects in the concert hall or studio where the sounds originated. Now the ratio of direct to reverberated sound helps us to locate the source. By experiment it is established that when the ratio of direct sound to reverberated sound is higher the listener locates the sound as nearer, when the ratio is lower the listener locates the sources as farther back.

In reproducing sound, then, the illusion of instruments arrayed in depth may be attained partly by eliminated reverberation from one or the other speaker. It may be that the mind spontaneously concludes to spacing the sounds at varying depths as the ear picks up the different amounts of reverberation associated with each instrument. Also the mind may give precedence to the direct sound over reverberant sound on the basis of arrival time and in so doing locate the sound in depth.

In view of what was said about reverberation, it should be pointed out that care must be taken lest reverberations be stirred up by reflecting sources or objects in the room in which stereo sound is reproduced, since they may interfere with and distort the sound that comes out of the loudspeakers.

Another feature of stereophonic effect is the sense of spaciousness. This is the illusion that the performance which the listener is replaying in his living room is really taking place in a large hall. The sound seems to pervade the room and saturate it. There is an auditory sensation of fullness beyond the apparent capacity of the two speakers from which the sound really comes.

This sensation of spaciousness, is achieved by the placing of the two stereo speaker cabinets at some distance from each other and by the reverberation that was actually picked up by the microphones and recorded on the tape in the hall where the music originated. Of course, care must be taken by the recording engineers lest the time intervals between direct sound and reverberation become excessive and produce disagreeable echo rather than the pleasing concert hall effect.

Opera was written for the stage and depends in great part for its success on lighting effects and costuming. Stripped of these and recorded in a monogroove, opera was reduced to ghost opera. Only a conscious effort to put the singers on an imaginary stage while listening made it tolerable. Now with the stereo illusion of direction recorded opera has made a notable advance. Light and color cannot be reproduced in a recording but the movements of the various singers can. The place of the chorus on the stage can be portrayed to the listener. Here is something then that can be more fully exploited in the art of recording opera. Since opera cannot be recorded with all the advantages it enjoys on the stage, why not use at least the advantage stereo does have in its auditory field and apply that to the recording of opera? The aural effect of the movements of the principal singers do involve the listener in the drama. Similarly the sense of direction of the off-stage choruses is more pronounced than on the real stage and there is a startling difference between the sound of a chorus singing, for

example, first in the open air and then inside a temple. These and other aural effects have already resulted in producing a new kind of recorded opera different from stage opera. In addition the stereo sounds of the opera orchestra can be brought to the ears of the stereo listener as they would not be heard in any theatre on earth.

London Records has been the leader in this new approach to recording operas. Other companies have followed. The dramatic effects will strike you if you listen to London's *Rheingold, Mefistofele, Fanciulla, Bohème, Aida.*

Character portrayal which involves different emotional states and mental attitudes is not very difficult when the singer can make use of gesture, costume and all the various visual props of the stage; but in a recording, character portrayal depends entirely on the color of the singer's voice. Outstanding is the character portrayal of Dietrich Fischer-Dieskau in Deutche Grammophon's recording of Mozart's opera *Don Giovanni.*

Among the very good stereo magnetic cartridges now on the market are Fairchild SM-1; SHURE M3D and M7D and GE VR225 and VR227. At the very top in price and perfection is SHURE, arm and cartidge combined—M212; and its equal in perfection but more moderately priced, PICKERING 380A and 380C.

It may happen that the distortion you hear comes not from your amplifier or speakers but entirely from your failure to set the stylus pressure on the record as recommended by the maker of your cartridge, e.g. 25 grams for 380A; 3-4 grams for SM-1, 5 grams for M7D.

Here are some recent recommended stereo recordings:

EPIC BC-1016. Handel's *Water Music.* This will appeal to nearly everybody; a fine recording.

EPIC BC-1025. Beethoven's *Piano Concerto No. 4,* Fleisher playing.

ANGEL S-35511. The same piece played by Gilels. Both excellent, and the stereo sound in both superb.

LONDON CS-6094. Beethoven's *Piano Concerto No. 3,* Backhaus playing. The first satisfactory recording on disc of this piece.

MERCURY SR-90134. *Fiesta in Hi-Fi.* Modern compositions brilliantly played by Henson and the Eastmen Rochester Orchestra. For young folk of any age.

MERCURY SR-90200. Tchaikowsky's *Serenade for Strings* and Arensky's *Variations on a Theme of Tchaikowsky.* Brilliant.

VICTOR LDS-6409. Beecham's version of Handel's *Messiah.* No matter what the purists say, I find this entrancing. The orchestra and chorus are brilliant and the soloists good. The tempo may seem a little slow at first but then the strong accent grips you and it seems just right.

COLUMBIA MS-6063. Mozart's *Violin Concertos 3 and 4* played by Francescatti. Entirely graceful and lovely.

THEODORE DAIGLER