NEW TECHNOLOGY - A VIEW.

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THE ENJOYMENT OF RECORDED MUSIC IN A TECHNOLOGICALLY ORIENTED SOCIETY

THE FUTURE OF MUSIC ON RECORDINGS IN A TECHNICALLY ORIENTED SOCIETY

I have been in broadcasting, recording, and audio equipment since 1943. I guess that gives me some long-term overview of our field and perhaps even the right to talk about it. I am greatly troubled these days about what I perceive to be a self-destructive path along which the recording industry appears to be moving. And I'd like to talk to you about it, since all of our professional future depends upon it.

First permit me to make a very important statement: "The actual name of our field of endeavor is MUSIC. It isn't tape, it isn't disk, it isn't cassette -- it's MUSIC." It should therefore come as no surprise to you that my interest in engineering is an interest only in a means to an end. We all sometimes get carried away a bit with the many fascinating "toys" which our industry produces, and it is at times such as those that we tend to forget what all these "toys" represent. Oh, I forgot to tell you: I was really trained as a musician. I spent my youth as a Vienna Choir Boy, I studied violin, piano, organ and composition, and until I was fifteen years old never even thought about anything technical. That came much later. My interest in engineering is solely tied to my enjoyment of music and my interest in disseminating music in its most enjoyable -- not necessarily playful -- form.

As a technical person I have lived through many "revolutions" in our field: the start of tape recording, the start of television; the start of Vinyl to replace shellac as a pressing material; the start of long playing records; the start of stereo disks; the false start of quadraphonics; the start of digital audio; the start of videodisks and the start of multi-track recording of popular music. Anyone who has witnessed this many "starts", must become accustomed to the pattern of "starts".

One thing is interesting to this observer: these "starts" keep getting more frequent and less revolutionary as we go along. I ask myself quite often why this is, and I believe I have an answer. There is a limit on the number of innovations which can dramatically alter our perception of music. Stereo was one such innovation. But the next step: from 2-channel to 4-channel, brought much less dramatic an effect than that first step from 1-channel to stereo. In other words, we are running out of new ways in which to enhance music. And only those inventions which serve the enhancement of music are ultimately successful.

Let's talk about human hearing a bit. One thing is clear: we don't know a great deal about psychoacoustics. What we do know is from relatively recent research, and much of that is suspect. I believe we will never really get as good a grasp of our hearing as we have of our sight. The ears appear to be much more educatable, much more adaptable than are the eyes. Or is it perhaps our brain which, stimulated by our aural organs, responds in very subjective ways -- ways which, like all subjective responses, change with time, experience and environment. We have always made very definitive statements about our hearing. This writer has always felt that such a rigid approach is much too risky. For every definitive statement which I heard 30 years ago, I have heard retractions not long after. One only has to read reviews of records made in the early twenties, using such terms as "totally natural", "indistinguishable from the live performance", "never to be surpassed quality", to know how prone we are to exaggerate when it comes to describing our aural perceptions. Caution is most definitely to be recommended!

I am sure you have often heard the statement that dogs can hear higher frequencies than humans. How do we know that? We don't even know what we hear, much less what dogs hear. It is true that dogs respond to higher frequencies than humans do, but "respond" is not the same as "hear". All of our psychoacoustic testing is based on "response", in other words on the interconnection in our brain between the sensation of hearing (input), and our verbalizing of our reaction to that input (output). I am unwilling to admit that there is a perfect communications channel between that input and that output. I rather suspect that there are many blockages in the way: blockages which have to do with prejudice, conditioning, wishful thinking, social amenities, etc. etc.

In my collection there are many recordings of the 40's and 50's in mono. Such gems as Toscanini, Bruno Walter, Jussi Björling, Kirsten Flagstad, etc. Great experiences in music, all of them in mono, many with restricted response range and noisy background, YET in many respects more musically satisfying than much of what passes for "state of the art" today. Why is that? Perhaps the answer may be found in the fact that the engineers in the control rooms of those days, unencumbered by so sophisticated an arsenal of electronic equipment, were able to devote their full attention to the judgement of that which is of paramount importance: the MUSIC. Producers were schooled and knowledgable, empowered to make decisions on the spot, relying solely on their own taste to help them to make those decisions which then led to a completed recording when the musicians left the studio. Today, by contrast, that task seems to go on endlessly, in a vain effort at "refining", "perfecting", "polishing". Much of the human quality which stems from the instinctive reaction tempered by knowledge, is lost in this process of filtering. How often do I remember recording twenty or more "takes" of a song, a solo, an entire piece, only to end up using the very first (imperfect?) one in the end, because it conveyed the most spontaneous human output. One wonders whether the quest for perfection represented by days and weeks of retakes and mixdowns, the many tracks made by musicians who never even meet in the studio, really contributes to the musical experience. It is something to think about.

But let's talk about the future of music in its recorded form. The digital world of audio began in 1971 at the first European AES Convention in Cologne, when Gotham introduced the DELTA-T 101 Digital Audio Delay Unit. It was an instant success, instant admiration. No question, the ability to thread up a string of billions of yes/no commands into a piece of music is a breathtaking technical wonder. But does it really improve our enjoyment of music? I question that.

It surely "facilitates" many of the processes in the production of recorded music. It makes such productions more convenient, more precise, less subject to deterioration in quality. But are not these advantages directed more towards suiting the convenience of the industry, rather than improving the transmission of music? Some say those two concepts are one and the same. But is that strictly true? Does it not rather license greater excesses in the processing of music, excesses which really do not improve music? We seem never to look back. We take those steps we feel bring us advantages, then years later come to realize that it has cost us dearly. What do we do then? Rather than to go back to the decision point where we took the wrong path, we try to retrieve the situation by adding yet another process, when in fact that new step introduces yet another round in this vicious circle.

There still is nothing better than a direct recording made with a minimum number of high quality microphones on a well-maintained professional recorder -- first generation. It has always been that way. Digital techniques make possible the retention of those numerous (unnecessary?) processing steps which supposedly help to "refine" the musical experience.

There is an attempt at an analogy between motion pictures and TV on the one hand and audio on the other. But as I had pointed out earlier, such comparisons must be looked upon with much skepticism! It is true that our eyes perceive 24 still pictures, each flashed twice onto a screen each second, as a "moving picture". The same holds true for 30 pictures (25 in 50 Hz countries), each scanned twice each second as "motion" on our TV set. We realize that these are all still pictures, and yet we see them move. We do know some effects which dramatically show us that they are not true moving pictures. The wagon wheels in those Westerns which appear to go backwards, drive home the limits of this technology, but we've gotten used to it.

Will we ever get used to the "backwards turning wagon wheels" which are to be found in digital audio? The assumption that between 32,000 and 48,000 "still sounds" per second will blend, will melt into an analog sound, has as yet to be tested over time. The 15 kHz complex waveform which is reproduced from the digital encoding format with but two samples must be "heard" by the brain, even if its verbalized output response today indicates that it "can't hear that". Time will tell.

RECORDING FORMATS FOR THE FUTURE

We have enjoyed round, flat disks for almost 100 years. We have had the ability to carry music around with us in our cars, on the beach, and tied to our belt for roughly 20 years by means of cassettes. One of these two formats appears to satisfy each of our needs: one that's quite large size with instant access to any spot on it, for the home, and one that is handy for portable/mobile applications. Now we are told by the hardware people that we must change to a newer technology: digital encoding and a laser for playback. It sounds like the future holds much excitement for all of us, especially when we address the playful aspects of our nature. But are we prepared to pay the price for these new toys? Do we have to pay that price? Again the hungry hardware industry says an emphatic YES! But, we say, music is for everyone, and not everyone is rich. Music finds its largest audience when the cost of bringing it to us is lowest. There is no doubt that the largely ammortized plant equipment which produces disks still yields the most reasonably priced music. Even cassettes are somewhat more expensive (at the same quality level) than disk, but also by now largely ammortized. So why should we change?

We are told that the quality of the pressed analog disk is insufficient for our enjoyment of music. We are told that ticks and pops surely destroy our enjoyment. I claim that the high price of the new digital technology will do that much more effectively! We have only just begun to explore the quality limits in disk recording technology. Look at the emerging DMM[tm] (Direct Metal Mastering) technique which, while lowering noise and virtually eliminating those annoying ticks, does so at reduced cost!! That's what we need: more music at a lower price.

The CD (Compact Disk) will cost a fortune, supposedly "automate" our enjoyment of music, never wear out, sound perfect -- and cost lots more than the LP does now. It appears, however, that the PCM recorded compact cassette is also about to burst upon the scene. And once it does, it appears that this already familiar format should catch on more quickly. But then what about digital technology on a large size disk? That too is available. We only have to utilize the existing videodisk formats, notably the CED Videodisc from RCA, as a storage means, and we are back to the familiar two formats: 12" disk and cassette, our two old friends.

There is a "fairy tale" which is rampant in the industry. That's the thought that it would be lovely to have all nine Beethoven symphonies on one tiny digital disk. That fallacy is based on the consumer's uneducated belief that it is the price of the pressing which makes the record so expensive. But we all know that of the $ 7.00 or so we pay for an LP, the actual pressing cost is something like $ 0.55, while the four-color album cover cost almost twice that much! What is expensive about a record is the music itself, and the well deserved royalties paid to composers, artists, publishers and the record company itself. Even if the pressing were free, that would hardly influence the selling price of the product. So a fifty cent pressing which has on it every song the Beatles ever wrote would cost just as much as the entire collection of traditional LP's it took to record them originally.

CONCLUSION

In the technological age of communications in which we find ourselves it is easy to confuse the medium with the message (1). The message is MUSIC. The medium is immaterial as long as it serves to bring the message to the maximum number of people at the minimum price! Let's all work on that aspect of the message rather than expecting the consumer to assume the additional costs of financing the industry's hobbies.

(1) Marshall McCluen, Toronto, Canada

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