

As presented in Banff, Alberta, Canada:

The keynote speech from the 24th AES International Conference

by George Massenburg

My esteemed associates...brothers & sisters in fine audio...above all, friends. Welcome. Let me personally thank all of you for coming to Banff.

How ironic, and maybe appropriate, that we are holding our Multichannel conferences in front of such imposing mountains. Maybe moving Multichannel ahead is perhaps easier than moving these mountains.

Today I stand before you as a producer of music, and I am humbled and especially proud to be here with some true masters in the field.

The headline for the **24th AES International Conference** on Multichannel Audio is "The New Reality". Before we delve headfirst into what promises to be the comprehensive, diverse and challenging proceedings I'd like to take a few minutes to mark *where we've been, where we are and where we seem to be going in Multichannel*.

Many of us gathered two years ago for the Surround Sound Conference in Elmau, Germany and discussed what we thought was needed to further Multichannel Audio as an art and as a basis for new business. There have been many advances since Elmau and there have been some interesting impediments.

In the last few weeks I've been mentioning to a lot of folks in the recording industry that we were having a "Multichannel Conference" in Banff. I heard no lukewarm responses. More than a few in the industry were skeptical. Enough so to at least cast a bit of a pall over the claim that Multichannel is a "reality" at this point in time.

Just one example. If you "Google" for the word "Multichannel" on the Web you will be surprised to find that the highest-ranked hits directes us to any number of Multichannel-**Marketing** sites-one "delivery channel" being, for instance, brick and mortar retail sales stores, another "channel" being "direct Web sales" or "mail-order" & etc. It shouldn't surprise us that **Multichannel Retailing** is very clearly a reality..

But let me try to synthesize where Multichannel **Audio** is today, quickly summarize the different areas, present examples, and give you some brief thoughts.

You know after doing this list and looking back on it, a pattern emerged that I'll point out...eventually.

1. As regards Classical Music recording and production

a. The good news from major labels in the US is that *given reasonable budgets* nearly everything is recorded with *the resources* (mics and tracks) sufficient to at least eventually re-mix for surround. I'd *like to be able to tell you* that Multichannel Audio is a given for classical music **releases** but, unfortunately, efforts are mixed.

b. At Telarc over 75% of releases go out SACD with both Stereo & Multichannel streams.

c. Clearly Philips is very actively supporting **core classical** and is doing so in SACD Multichannel. They have recorded over 50 titles in surround.

d. On the other hand, most of the majors, including BMG & Warner's worldwide, have abandoned **core classical** music almost completely, save for reissues or "special projects". Even at Sony **core classical** is much more likely to be released in 2- channel stereo; only perhaps 5-10 of their 100 or so releases in a given year have Multichannel streams.

e. It's hard to ignore that the purely classical music business in any format is still struggling in the marketplace, although music on the **margins of classical** - world music, Jazz, avant-garde, contemporary- are faring much better.

f. As you look further down the scale to the independent labels, and to more mid-level classical productions, increasingly one is likely to find them recording only in stereo, even when the added expense is modest. I've heard more than once that there is no confidence in the current implementations of the center channel and there's quite a bit of work being done in 4.0. And, at the bottom of these mid-level budgets, there are more than a few projects recorded to 16-bit DAT.

g. Nonetheless, multichannel classical music presentations make the most impressive demonstrations. The best of these are often utilized in high-end audio sales rooms to invoke "the John Eargle effect", which states that the better the demonstration is, the faster checkbooks will fly out of your pockets.

2. Concerning Multichannel in the Cinema.

a. The success of multichannel in the Western world (now thought to include India as well as Europe) is in the range of 56 to 58,000 screens. Of those about 35,000 are in the states. Both Dolby and DTS have penetration in the 90% range. THX has about 1,000 of these screens, mostly on the West Coast.

b. Film scores are for the most part being produced multichannel. The music mixers that I've spoken to in Hollywood are recording and delivering **ALL** of their scores in 5.1 or in a few cases, 7.1. In most cases the final mix makes use of that Multichannel score for the final theatrical release. Multichannel in cinemas is growing, US and worldwide.

c. With the release of the Star Wars Episode 1, Dolby EX (acting on an initiative from Lucasfilm) provided an additional array in the rear. I'll ask us to make a note here that what was desired is a more defined localization *in the rear*, especially for pinpoint sources at or near the **center rear**. It's still desired.

- d. Here's a hopeful note: if a film deal is made for **pop music** and multichannel stems are provided, it generally finds its way into the theater in 5.1.
- e. Unfortunately, it is not clear that there is any support on the horizon for extended resolution or bandwidth, although there is always room for more speakers (more about this later). And when the music and effects mixers that I spoke to were asked what they'd most like to see in the future in cinemas, their first response was, "Make all of the speakers the same as the full-range speakers in the front."
- f. Theater owners, a stressed market segment if there ever was one, will no doubt weigh the investment in any new technology, be it direct digital delivery or full-range rear speakers, only against increased popcorn sales.

3. DVD-V and Multichannel

- a. The success of DVD-V is well documented and I won't go into it here except to say that it was last year's success story and there's no doubt that it will continue to grow.
 - b. There are somewhere between (as few as) 45 million and as many as 125 million DVD-V equipped players out there in the world, depending on who you ask. It's extremely hard to tell how many home theater systems are actually set up and playing multichannel, but conservative estimates are less than a million.
 - c. It's been confirmed with several houses that remix for DVD-V, that these releases almost always use the original Multichannel stems, including the 5.1 underscore as well as Multichannel dialog and effects. Also, if somewhat rarely and only if the budget supports it, new 5.1 content is implemented.
 - d. Also, successes abound in **music** on DVD-V. Let me give you some figures for Canada alone:
 - i. Norah Jones live DVD at 30,000
 - ii. Diana Krall "Live in Paris" DVD-V 50,000.
 - iii. Paul McCartney DVD is over 50,000; interestingly, sales of the CD of that concert are only 71,000.
 - e. I found it difficult to get exact sales figures for the Eagles DVD-V of their "Hell Freezes Over" live tour recording, but rumors are that it's significant.
- ### 2. There have been notable experiments in Multichannel Broadcast.
- a. In February our associates at Swedish Radio, who are represented here, announced that they would begin Digital Video Broadcasting on Sirius 2 satellite, available to the Nordic and European regions, broadcasting DVB along with 96Khz 24bit audio in DTS format. The trials were to end in April and we're anxious to find out what they've learned.
 - b. Secondly, they are offering a free 5.1 demonstration download in DTS format, both 44.1 and 96k from their website. I downloaded (legally) a sample, burned a DTS format CD-R, and had myself a quick and easy Multichannel demo. In 9 months they reportedly saw 800,000 downloads, 80% of these to users outside Sweden.
 - c. Broadcast television in the US is a different story. The 2002/2003 television season marks the fourth consecutive year that CBS broadcast the majority of its primetime schedule in HD, and the second season that it has offered all of its scripted entertainment series in the HD digital format. By the end of 2002, CBS expected to be transmitting digital programming across more than 100 owned and affiliated stations, reaching over 83 percent of the country.

d. Unfortunately, to the best of our knowledge, until this year's Grammy presentation CBS had never presented anything in 5.1 and HD; Phil Ramone and his team basically had to direct a seminal installation.

e. The future is a bit more promising: the US government has mandated benchmarks for the implementation of HD television over the next decade. And the government is quietly driving resources to PBS stations to fund Multichannel production and broadcast. There are plans for some shows, such as "Live from Lincoln Center", to go out this fall in HD & 5.1. "Austin City Limits" is reportedly generating material, and is almost ready to do 5.1 broadcasts.

f. Something to think about: at the most recent NAB show, **surround** music packages for station ID tags started to become available.

3. Popular Music Recording & Releases.

a. Quite a few record companies are ordering 5.1 pop mixes along with 2-channel work even when their immediate plans only call for 2-channel music releases. Most often, 5.1 mixes are initially used in DVD-V's. Occasionally, there's a simultaneous multichannel release.

b. Notable among multichannel record companies are...

i. DTS Entertainment, represented here, one of the first to make a concerted effort to merchandize Multichannel and now providing both DTS and DVD-A formats

ii. Sony, with arguably the Multichannel hit of the year in "Dark Side of the Moon", among many other releases in SACD.

iii. Telarc (which produces not only core classical but pop, jazz & blues as well). Telarc releases in SACD

iv. WEA, who is aggressively repurposing its deep pop catalog for Multichannel as well as doing new releases, exclusively in DVD-A.

v. Universal, who is currently releasing both SACD and DVD-A.

vi. EMI Music/Canada, represented here, pursuing an enhanced package to include DVD-A and DVD-V and Red Book when this technology is feasible.

c. I'm going to say as little as possible about formats save this: DTS & AC-3 decoders are available in the majority of existing one hundred million DVD-V players. As far as SACD & DVD-A capable players are concerned, there are far fewer units, and the numbers for truly universal players like the Denon and the Pioneer are even farther below that. It's hard to know what the unit numbers really are between SACD & DVD-A; both manufacturing camps make claims of between 4 and 5 million units, and outside estimates range from just below 2 million units. I'm just going to move on.

d. Popular music is perhaps one area where we've been over-anxious for results, using traditional Pop CD sales numbers as reference points. For instance, currently the top sales bracket for a multichannel release seems to be in the range of 50,000 - 100,000 disks, compared to where we try to focus on a pop hit, which is more around 1-3 million units, depending on the format. And caveats abound. For instance, "Dark Side Of The Moon" has sold as many as 100,000 disks, but it's also a hybrid release with a remastered Red Book layer accompanying the 5.1 and 2-channel SACD streams. By contrast, the Queen DVD-A that Elliot Scheiner remixed last year has sold around 45,000 copies. Right now this seems to be the average number for a modest Multichannel success.

4. Professional Electronics - in short...

- a. Digital audio workstations are more and more multi-channel capable.
- b. Since Elmau several high-end Multichannel production tools have become available including reverbs from TC Electronic, Lexicon, Sony, and effects processors from Eventide among others.
- c. Unfortunately, new development seems to have slowed down considerably. I've been told that sales of certain of these tools have been less than encouraging, and there's a rumor that the 777 has been discontinued.

5. The Automobile

- a. For some time now the mantra of Multichannel, such as it is, has been, "We will see the breakthrough when Multichannel systems get into cars." I'm sure many of us remember hearing the Harman demonstration system in Elmau, and since then several models have become available with surround sound systems, notably the Volvo, and this year, even a Lincoln with a THX sound system. Speaking for a group of music engineers currently very active in 5.1 Multichannel mixing I'd like to say that we're more than a little unhappy that so many current offerings **aren't discrete 5.1**. We are told that it is because the design cycle was begun before discrete hardware was available, but one wonders why, when other major manufacturing industries can turn around completely new designs in 2 years or less, automobile manufacturers, another deeply challenged industry, can't do *better*.
- b. We are thrilled that Banff has a number of promising car demos this year. We're anxious to hear them.
- c. But the automobile has turned out to be a very special case; there are significant challenges to delivering great audio in the car, SUV or van, notably how to do deliver the best "Surround Experience" to all of the passenger positions. There has been considerable **serious** work by many in this area. And speaking for that same group of 5.1 mix engineers I'd further like to add that we take offense at the notion that automotive sound designers insist that they are **more** qualified to judge what constitutes an effective "Surround Experience" than we are, especially as it ignores or corrupts the musical intention.
- d. I'm told that most automotive manufactures are loathe to implement a matched, full-range center speaker; we're told that there's no room for it. We're told that automobile manufacturers simply won't give a millimeter of dashboard space or volume. I say we get them together with Don Henley, or Graham Nash, or Sheryl Crow or whoever their most venerated artist is to shame them into what they **should** be doing.
- e. Beyond that, **the question is:** whether we as mixers should support or avoid that weak center speaker in our mixes. The thinking I hear most often is that special cases should be accommodated by special processing at the delivery end, and that we shouldn't lower our standards.

6. May we take a moment to review multichannel in Video Games?

- a. From the largest manufacturer of software in the US, I can tell you that there is considerable progress in Multichannel, but I must inform you of the following:
 - a. In video games, picture is everything. The audio stream gets, on average, 5 to 6% of the player's bitstream capacity. Anything that disturbs the video performance gets

knocked back. One Electronic Arts game, SSX Tricky, a motorcycle game, used up to 10% of the bandwidth for sound, and was widely panned for a "slow picture".

b. Nevertheless, many game boxes have Multichannel capabilities. The X-Box can utilize Dolby AC-3 and ProLogic. The PlayStation II does ProLogic and more recently DTS. Most often 4.0 is implemented, sometimes 5.0.

c. Some PC native games implement 5 channel surround for sound cards, notably the Creative Labs Soundblaster.

d. Most games utilize surround for dramatic **effects**. For the recent "Lord Of The Rings" game, Electronic Arts were given the 5.1 Music stems, but these were truncated to stereo. Nevertheless, a few Playstation games have music going into surrounds.

e. Finally, most often the sound channel is implemented as 22.05k, with compression of around 3.5:1.

So, looking over this, you could say we have a mixed bag of successes. Incidentally, looking over this list of disciplines and the revenues associated with each I'm drawn to make the informal, loose conclusion that, "the lower the quality, the higher the revenue" and vice-versa. I mean, one video game title alone, the John Madden Football franchise, is perhaps a 2 billion dollar industry in and of itself.

Nonetheless, across all implementations of multichannel, there is a common thread, which is the excitement of content creation. Forgive me for stating the obvious once again: for those of us who **make** music - **for those of us who make mixes day-by-day for Multichannel** - a door is opened by multichannel, and it's a big door to new possibilities. And it's one that we hate to have to pass back through. After you've had that immediate, visceral response to the size and the spatial texture and the animation that's available, after you *hear* that sense of time and place and *story*, there's simply no going back. Not happily.

So, where to go technologically?

We certainly need to do more of what we've always done, which is: *continue to experiment with what sounds good*, staying tuned into what else is going on out there, and then to grow techniques to do *even better work*. Oh, and make every effort to do great demos.

At the same time it would help greatly - and let me put it very simply - *to not repeat the same mistakes with the technology*.

For instance: we know from our old experience in Quad that one of the biggest problems was in the delivery format or formats. I believe that one of the villains there was the matrixing that was forced on us - and we were so easily persuaded to accept the compromise. Did we learn to work with it? Yes, over the years a 4-2-4 matrix was used with success in cinema surround. Was it right, assuming "right" means "sounds good"? Well, no, it wasn't very good, but it moved us ahead.

I hope we're beyond that now. Simply put: discrete delivery channels best preserve the **intention** of the artist, producer & mixer.

And time and time again you'll hear the same refrain from us about sizes of the speakers. Not to sound like a skipping CD, but ***please let them all have the same full-range performance***. And about that pesky center speaker: we're either going to use the center speaker and call this technology 5.1 or we're not. I really like to use it, and others do, too, in a properly implemented playback system. Maybe we should mix as if we'll eventually solve site or system-specific problems downstream where they come up.

So, O.K., O.K., it comes to a go/no-go situation based on cost and we have to compromise - and we always do - could we all at least compromise *with some reluctance*? And when the productizers are deciding on ***our*** compromises, could we please hear a little bit of what you have in mind? And maybe even talk about it?

Now as far as the software, we have more work to do, because as good as the classical multichannel demos are, we're still struggling to make pop music as universally effective..

Here's what we content providers will do for you while we sort things out: we'll make better recordings for less money. We'll be way less self-indulgent... and we promise to use less vile, opportunistic compression and fewer hideous-sounding plug-ins.

Maybe we'll even try to stop sneering at making accessible records.

But may we ask you to please understand what ***we do***?

I would point you to Henry James, who affirmed, on behalf of his own art, "We work in the dark." Multichannel, especially for pop, is still a *new* paradigm. It has *new* rules. It's a new *art*. We don't know what it *can* be yet. We just know it can be better.

Producers and mixers must truly think like *innovators*. We're going to *have to work* with tools ***new to many of us*** and we're going to have use them to charm artists into our dance. We have no *choice*; to craft the compelling presentation of the future we will *have to seriously woodshed* with artists & musicians to *find a story* to tell in a Multichannel context. And until it's ***compelling***, we have to keep trying.

Now, let me speak to equipment manufacturers about those "tools"; yes, we know that we have to implement what you've already made for us. But in pop, in particular, we are still lacking the ability to do some very basic, and important, things.

O.K, we're trying to take more tracks *live*. But we can only go so far in a business that's for many years ***been defined*** by the flexibility of working with very many source tracks & time-displaced performances. What is so convincing in the big ambiences - the big reverbs, the long, diffuse tails - in classical presentations in Multichannel are for the most part *utterly unsuitable* for pop work. It's time to move beyond the Schroeder reverb work. It is more important than ever to be able to model small, real spaces, *however* complex the processing.

Also notable is the lack of available tools to easily, *convincingly* animate sound in 5.1 - to move a source around throughout a 2 dimensional space. Guys, our fine researchers from Japan have demonstrated time and time again that *moving sources better define localization*. You know, the multichannel panner is the very first feature that the ingénue remixer reaches for on his or her first Multichannel mix.

I'm happy to report that since Elmau Moore's Law is still applicable, so, please don't whine about processing power or cost. Build us a useable virtual room. Please.

We have great hope that in the future this *can be done* extremely effectively in surround because we've now heard it done with Wave Front Synthesis. If you haven't heard it, the demo is here in Banff and I urge you to take it in. Let me take a giant step and say that in **my** mind technology such as this (and you know, it's not *new*) is most likely to be the 15 - 30 year future of Multichannel presentations, and hopefully much sooner. And also in **my** mind this clear vision of the future validates all of the **other** innovators who are experimenting and commissioning systems with more and more speakers, notably Tom Holman.

So we know where we're going, now let's be geniuses and try to figure out how to get *just a bit of* this in 5.1.

Now, I know that someone out there has to buy this stuff...and that there's a *risk* involved.

Speaking only for myself, I currently live in a region in the US where producers are more or less loathe to spend money on recording technology, and do so only when threatened. Even in the face of a business model that's quickly and demonstrably crumbling, the priorities of most main-stream Nashville producers are: 1> new cars (or new/old cars), 2> new houses, 3> new motorcycles, 4> new boats and 5> time-share jets...more or less in that order.

I've none of the above, and have instead invested in the technology. And to know why I think it'll eventually be successful you only have to **listenJ**. For instance, you have only to **listen** and compare the noisy and unpleasant 2- channel mix of Faith Hill's last record to Elliot Scheiner's organic and detailed Multichannel mix.

I have faith because, you know, lurking in the counter-culture where I live are some of the finest musicians, writers & innovators in music today. They are anxious and motivated to get to work making *music* again. And there is no better time to experiment than now, while the record business is in a meltdown and even *at that* are still making execrably bad records. We have a bit of a breather - some room to experiment - better to find our own way in the new paradigm. Recall that it was engineers like Bill Putnam who were the pioneers in credibly advancing stereo in the early 60's, and that in many instances he made his own, private stereo recordings during what were to have been mono sessions. He did this at his own expense -and he did it because it sounded *good*.

Oh yeah, eventually record companies came back to him to negotiate a fee for these stereo masters.

To summarize: pop music mixers are going to have to work harder, cheaper...and more effectively. I would suggest that we consider in the very near future making multichannel mixes a component part of the mixing phase of each new project. Oh, by the way, keep in mind that no less than Bob Clearmountain does this now - includes 5.1 mixes as a standard part of his deliverables.

For Multichannel to move ahead in our individual careers if not our lives, we have to have - and I'm sorry to have to return to this year after year - we have to have faith that if we do great work we'll win the non-believers over one-by-one. There are *going to be* delivery channels for what we do in Multichannel Audio. We have to have *truly impressive* work ready to go by the time the opportunity comes along. Not vice-versa. Let's make **that** the reality.

I certainly have many people to thank for coming forward with ideas and numbers: among these the contributions of Geoff Martin, Jason Corey, Bob Woods, Elliot Scheiner, Stuart Bruce of Real World, Fraser Hill of EMI Music Canada, Jeff Levison & Jeff Skilling of DTS, James Guthrie, Gary Rydstrom & Leslie Ann Jones of Skywalker Sound, Laurie Fincham of THX, David Smith and David Kawakami of Sony, Murray Allen of Electronic Arts, Phil Ramone, Ed Cherney, Bruce Botnick, Dennis Sands, Frank Wolf, Tony Faulkner and Mike Novitch of Warner Hollywood. Special thanks as well to Theresa Leonard and John Sorensen for assembling great demonstration systems