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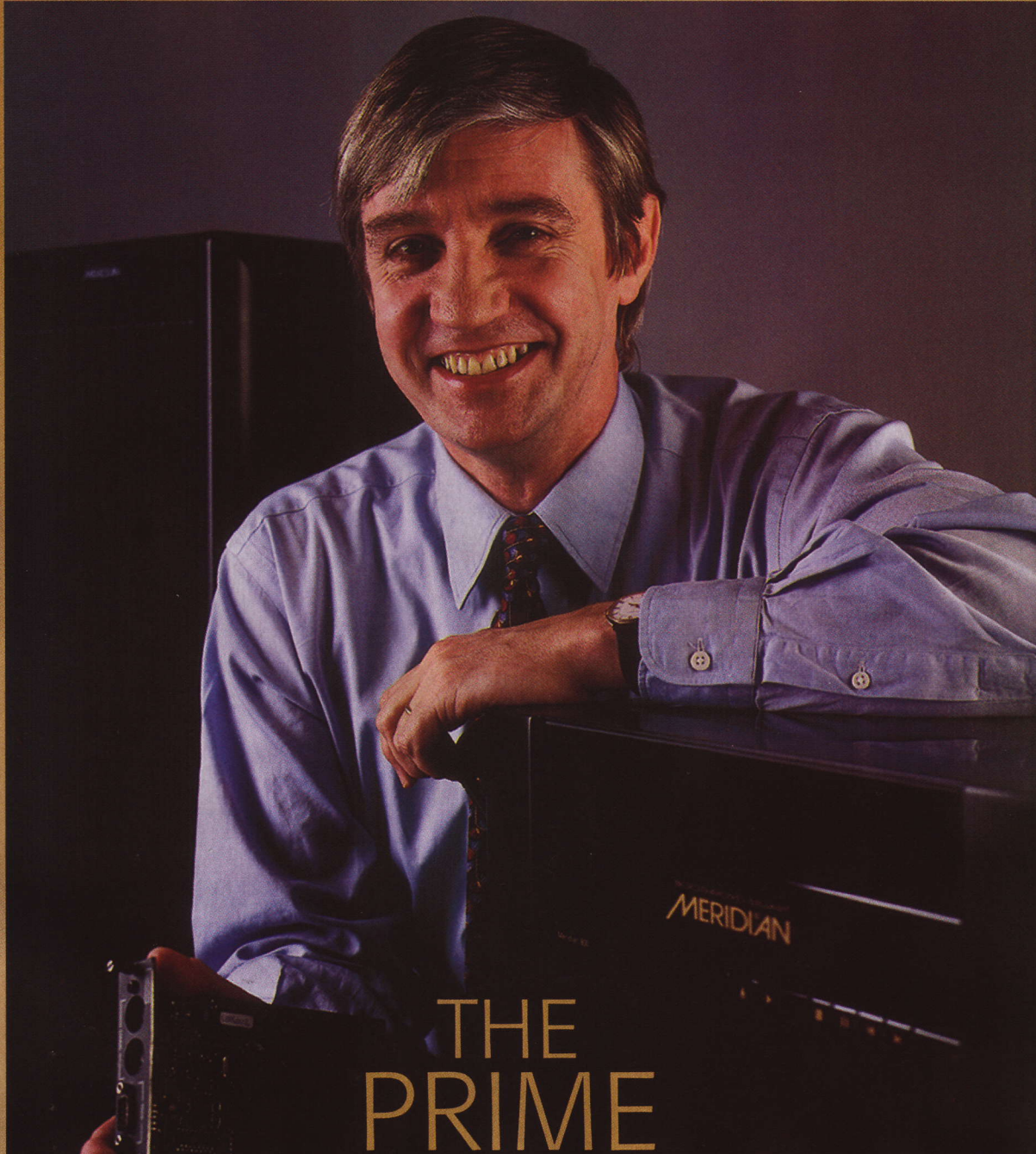
Meridian's
BOB STUART

talks about hi-rez digital
and why a format war
is the last thing
the industry needs

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LANDMARK FILM
BECOMES A CD**



THE PRIME MERIDIAN

BOB STUART TALKS TO STEVE HARRIS

THERE ARE MANY COLORFUL characters, many high-profile movers and shakers, in high-end audio, but there are only a few whose influence extends far beyond the promotion of their own brands. One of this exalted and mighty handful is Robert Stuart, chairman and technical director of the UK's Meridian Audio.

Softspoken, with a disarming smile and a puckish sense of humor, Bob Stuart has been at the helm of Meridian ever since he and the outstanding industrial designer Allen Boothroyd cofounded the company as Boothroyd-Stuart in 1977, and in the last 15 years has quietly taken on a much larger role in the industry. In

1994, with DVD-Video on the horizon, Stuart chaired a pressure group, the Acoustic Renaissance for Audio (ARA), which aimed to make sure that the film industry and the electronics companies didn't forget about audio quality in their rush to offer a new video format. These efforts were rewarded by the inclusion of the two-channel, high-resolution, 24-bit/96kHz audio option in the DVD-Video standard, which made possible the DVD-Audio disc.

Meridian was the only UK company to become a member of the DVD Forum, the body that determined the DVD specification. In what he calls "the lossless summer" of 1998, Stuart and his team

showed the DVD Forum how Meridian Lossless Packing could make multi-channel 24/96 audio possible, and MLP was adopted as part of the DVD-Audio standard. And after this, Stuart became deeply involved in the process of formulating the requirements for a new high-resolution video carrier.

Meanwhile, back home in Huntingdon, Cambridgeshire, the expanding Meridian had already outgrown its new factory, which had been ceremonially opened by then-Prime Minister John Major in 1996. In 2004, the company acquired its present, very large and impressive, headquarters and factory building, which had been built for the short-lived TAG McLaren Audio operation. Scaled to TMA's grand ambitions rather than to its actual needs, this superb modern facility came complete with anechoic chamber, EMC test suite, and several purpose-built listening/screening rooms with full acoustic treatments—although, as Stuart says, “We did tweak all the rooms. We certainly made it sound like we wanted it to!”

When I spent an afternoon there with Bob Stuart some months ago, he talked of Meridian's recent life-changing deal with Faroudja, new formats, and the future. But the first topic to come up was the state of the CD-player market.

BOB STUART: It's certainly alive and well where we are, Steve. The new audio formats haven't produced a catalog of any size. If you are a music lover, you have no choice but to listen to CD, or to download it in some awful format.

When DVD came along, we could and we did make DVD players that played back CD very well indeed—but a dedicated CD player is always better than one that does other things, no matter how hard you try. There are also people who want a CD player because they actually don't want video—the customers who say, “I don't want a DVD player in my house, I just want to listen to music.”

Now, the Meridian 800 DVD machine is a fabulous DVD player, but it's also a really good CD player. But nevertheless, when I took out the DVD functions, when I took out the ability for it to make a picture, the sound quality on CD got better. It's all about refining and refining. No matter how well you design something, if you can remove a potential source of interference, it'll get better.

That's how we did the 808. It's the most musical machine—you put a CD on it, you just get lost in the music. Because it has no glare, it is tremendously open—deep, tremendous space—it's really, really easy to listen to. And that's the kind of sound that Meridian has always headed for. Absolutely locked: the sound of real instruments in real space.

STEVE HARRIS: So 16-bit is enough, then?

STUART: No. It's not enough. On some recordings you can hear the limitations of that. More the limitations of the 44.1kHz than of the 16 bits. Sixteen bits give you a 90dB dynamic range. If the recording is properly made and the A/D converter's good, and at the mixing or mastering stage they didn't forget to dither it properly, within the window between the peak level of the

music and the noise floor of the recording venue, then the hiss of correctly done 16-bit audio is around the room-noise level—sometimes it's above it, and that's a problem. But 44.1kHz, there's no doubt that that was a bit mean at the top end, and on certain instruments, violins and so on, you can hear that—just a little edge sometimes, which comes from that sample rate.

We make it a lot better in our player because we say, “Well, okay, there's nothing we can do about the way the recording was made, but we don't have to compound the error by using more and more and more filters at this speed.” So in the 808 we upsample in resolution terms so the player is in fact playing back at 176kHz/24-bit. And that gives a much smoother sound than playing back at 44.1kHz. If the recording's well done, it's okay.

More bits would be helpful. Back in the late 1980s, we did a lot of work on noisesappers. And we made A/D converters that could be used for making CDs—a lot of the *Stereophile* discs, for example, used the Meridian 518 or 618 noisesapping processors, and a lot of recordings from people like Tony Faulkner—they'd start with 20-bit and then use our processor. So you can get more than 16 bits' effective dynamic range on a disc. But to play that back, you have to have a player that doesn't do stupid things, and 99.999% of players will truncate a signal. Our players won't. So if you've got a beautifully made recording, you can actually get more than 16-bit anyway. But you can't get more than 44.1kHz.

The recordings with the 518—listen to some of the ones that John Atkinson did, or Tony, they're breathtakingly clear. It's a question of how close the microphone is, how important the 44.1kHz is. For a lot of natural acoustics, chamber music, things like that, it's less of an issue. But if you're right in close—like that thing we were listening to here this morning, where the microphone is clearly stuffed into the bell of the saxophone—switch to 96kHz recording and it's better.

But we believe that we should provide the best instrument for people to enjoy a music collection. People say, well, “This is better,” or “SACD can do this,” or “DVD-Audio can do that”—but if you can't find a recording by the artist you want of the piece you want, it's a nonstarter.

HARRIS: Even if CD sales are healthy, Meridian's primary focus today is the home theater market. In mid-2005, Meridian signed an exclusive worldwide agreement to manufacture and distribute one of the most respected and innovative video-technology brands. How did this come about?

STUART: When we were approached by Faroudja, we'd worked with them over a number of years at shows. They'd put up an exhibition and we'd give them a sound system, and we'd use their projector in our booth, stuff like that, so we kind of knew each other. And they just said that what they were looking for was the company that matched their brand in audio, the company that did the best quality, that could market the product.

The reason that all happened is that Faroudja had ended up being owned by the semiconductor house Genesis Microchip, and Genesis no longer wanted to manufacture boxes. There's a huge difference in scale. The chip company was much bigger than the box company, and it's very hard to run a business like that. It's hard to provide the focus. Whereas, for Meridian, what Faroudja were doing was a perfect fit. Same kind of dealers, same kind of distributors, same goals—to make the very best home theater, and from home theater up to screening rooms. So we were very excited. The terms of the deal are also quite unusual. It's a very modern sort of arrangement that we



Meridian's Huntingdon, UK headquarters.



Meridian 808 Signature Reference CD player.



800 DVD Player and 861 Surround Processor.

reached. We took over the business operation, so we make the boxes, we make video processors, we make the projectors. We'll make other things—there'll be display devices coming, and we'll be making other video processors.

But we also have access to all of Genesis Microchip's video R&D, including all their new video algorithms. So if they've come up with something that we think is cool, we can put it in the product, and we can end up with it in the marketplace two years before they can bring it out in a chip. Which helps us both. Because we have the technology wholly, we can lead the market, which is what we need to do. But they can have their technology field-tested, and they can also have it exposed, so they can say, "Look, our new chip, coming in three years, will have this feature."

So it's a kind of win-win thing on both sides, which is unusual. We were very happy to take it over, and since we were able to do that, it's led to other things for us. Because to establish yourself as the best video-processor maker could take any company five to seven years; you've got to build a brand for that. What we were able to do was to take the Meridian brand, which is very strong in audio—and not weak in video, because the DVD players have a good reputation—and attach to it a 30-year-old brand which, in most parts of the world, is equated to the best in video, which is Faroudja. And put the two together. It's pretty exciting. We're glad we did it, even though absorbing anybody else's business is a traumatic thing to do.

HARRIS: Adding Faroudja, then, has finally enabled you to complete the Meridian Digital Theatre line?

STUART: Yes, very much. Because it's what we've worked for at Meridian, right through, we always had a goal. My view has always been that the longer we can keep the data in the digital domain, the better. And that's why we were the first company, I think,

to do an outboard DAC [in 1985–1986].¹ As soon as the S/PDIF digital interface was available, we moved into digital speakers. In fact, in 1985 we showed a prototype digital speaker at the London show. By 1988, we had a digital speaker in production. That idea led to digital surround-sound processors that would help with the rendering—do all the delays and equalization, all the things you need to do to paint a picture with the number of speakers you've got—and then the digital speaker itself.

When DVD started to get popular and people wanted surround sound, we started to talk about Digital Theatre. Digital Theatre to us at that time was the sound—digital all the way from the DVD to loudspeakers that were playing back in surround sound—but we couldn't develop the picture.

Some of the things that we learned from audio we brought to the video table. Things like transparency: What does it really mean when you can have low noise and uniformity in the picture? The answer is, you can see further, with a greater sense of depth. Questions that video engineers didn't ask, like "What happens if you reduce the jitter on the video?" And the answer is, the picture looks better.

So we were able to do those sorts of things, but there was still an area of video processing that would have taken us quite a long time to acquire. And we wanted to be on the display side of it, because we felt that we could provide the best experience

by closing the loop. The thing that I really like about it is that the picture quality we can make is outstanding. As you know, we're doing projectors based on the D-ILA technology.

Usually, pictures that you see will have been processed several times—once in the player, and then finally in the projector itself, with the projector scaling—and if they're not using the right sort of dither or the right sort of algorithms, then you get grain building in the picture. But we do the digital processing in the Faroudja DVP-1080 video processor and then straight into the projector, which is digitally connected, pixel to pixel, in the panel. The thing that's really cool about our projector is that there isn't a processor inside it. If you don't give it 1080p, you don't get a picture. So we put in this progressive 1080p, 1920x1080 pixels—it's a lot of pixels—and that works very well. With the DVD player, the digital surround processor, the digital speakers, we're digital all the way

right up to the speaker on the audio side. On the video side, we take digital video over HDMI from the player into the video processor (the player actually deinterlaces it, because that's the right place to do this), you take 480p into the video processor, where it's scaled. Seventy percent of the picture you looked at



Meridian 800 Series I/O cards.



G Series components: G08 CD player, G02 controller, and G56 power amp.

here this morning was manufactured by resolution enhancement. But wasn't the detail amazing? And that was DVD!

HARRIS: Which brings us to the new hi-rez video formats, Blu-ray and HD DVD. But don't we need to talk about DVD-Audio and SACD before we get to what's happening next?

STUART: I suppose so. It's all kind of interrelated, isn't it? I've said what I've said about the sound quality of CD. We've always felt that there was room for something better. You've heard it. Whenever you've heard a high-resolution recording, it is better. But we tried to bring DVD-Audio and SACD to market at a time when the music industry was at its sickest. The five majors were just shedding people all the time, consolidating, their market share was falling. There was nobody in the music industry anywhere that really had the bottle to say, "We're going to invest in this and make it happen," because when the company's losing money and everything's sort of imploding as far as the music industry itself is concerned, that kind of decision could lose you your job. It was a very bad time to try for higher quality.

Everyone in the upper part of the music companies definitely understood that if you could make a premium product that you could charge more for, then that would be good. But they did try to get the whole thing tangled up in an agenda—copy protection—which was nothing to do with the customer's benefit.

We came at it from the ARA [Acoustic Renaissance for Audio] and Meridian end-of-sound quality—saying that if you give people surround sound in higher quality, they'll hear it and they'll like it. The music industry said, "Yep, that'll be cool, but they're not going to notice the sound-quality improvement so much, so we've definitely got to give them surround sound. We've got to give them this feature and that feature, we want pictures, and we want menus. But also, beyond anything else, we want copy protection, because our biggest problem is that we're being ripped off."

I think history has since shown that this is not true. There is leakage with copying of music, but things like iTunes have legitimized downloading. A lot of people are quite happy to pay for a song—the fact that they were copying discs and downloading illegally was just that there wasn't a better vehicle. I don't know if you agree with that, but there's certainly some element of truth in it.

¹ Sony, Arcam, Musical Fidelity, and PS Audio also launched standalone D/A processors in 1987. —Ed.

Anyway, sharing music gets people interested in music, but there's always this tension... any content provider is always worried about copying machines. Do you remember all the fuss about [audio] cassette recorders? And Hollywood tried to stop the sale of VCRs! Because they thought that if people could copy things that were broadcast on television, they'd lose their revenue. As it turned out, in the pre-DVD era, half their income was coming from the sale of tapes. Slightly off the track, but this is all relevant to the whole picture of high-resolution audio.

Even if it had been the right time, a format war is a nightmare, because the consumer quite rightly says, "Well, I don't know which one to buy. I'll buy nothing." If the entire industry had been behind DVD-Audio, it would have gone a lot further and faster than it did. As it turns out, DVD-Audio is alive and well—but it's in DualDisc. It's not where it started. But I do know that in the first three weeks of DualDisc being launched, with the CD on one side and the DVD on the other, they sold more discs than had been sold of DVD-Audio or SACD in the five years previously.

This is a distraction, but we'll go there: I think DualDisc is a very powerful format because you get the CD, you get the higher-quality audio, and you get video content. And although I don't believe for a minute that people should sit watching concert videos instead of listening to the music—it's a very different experience—just the fact that you can have this information about the artist, I think helps connect you to the music. The one I keep quoting which I think is a really good example is *Time Out*, from Dave Brubeck. [According to Sony/BMG, this title's release date is yet to be confirmed. It is currently "on hold while business agreements are being sorted out."] On one side you've got the CD, which sounds like it's always sounded. On the other side, you've got the same music in high-resolution surround. But in addition to that, there's a 30-minute interview with Dave Brubeck. And there's a multi-angle session where he shows you how to play "Take Five." And to me, these two things tell me so much more about the artist. You just see it once, and you listen to the music again. It's so much better than any liner notes could have been.

Now there are hundreds of DualDisc titles. But while this was all happening, the popular thing to do was to download the music, and something almost like the commoditization of music was going on.

HARRIS: And it took somebody outside the music industry, Apple, to pull that together.

STUART: Yes. Masterstroke, fantastic. It's improved the sales of music, which is great, but it's done nothing to bring to people's attention the fact that it can sound a lot better than it does. And it sort of turns music into something that you consume on the fly instead of listen to.

Now, I'm not a snob—you can listen to music anywhere you like—but the fact is that what you download from iTunes doesn't sound so great. It doesn't come close to a CD, so it doesn't come close to a high-resolution disc. And it did show something else that I think was a bit disappointing, which is that there is obviously a level which the average consumer is prepared to accept for quality.

The CD specification was laid down by Philips and Sony, and like I said, it wasn't quite good enough. If we'd had the chance,



Meridian's new Faroudja D-ILA1080MF1 full-spec HD projector.

it would have been a lot better at 48kHz than 44.1kHz. If it could have been 20 bits at a 55kHz sampling rate, it would actually have been good enough for ever, in my opinion. In that window, you can fit the things that people can hear. (It doesn't have to be 96kHz/24-bit, but that was a logical choice, given where things were with DVD.) But anyway, the point is that when it came out, CD provided a level of quality that, for the man in the street, was a huge improvement over his LP.

That's where the consumer experience is completely divergent from the readers of hi-fi magazines. The man in the street's idea of an LP is something that's scratched, and ticks and pops and wows and all that stuff, and it's fragile, and it doesn't have random access. The random-access feature of CD and the consistency of what you got off it was good enough. "Why do I want something better than that?"

And then we had pretty much the same thing with DVD—and this has a bearing on the next question. DVD was a radical step up from VCRs—menus, features, skip through the chapters, sound quality was better, picture quality was better. But to expect the bulk of the market to want to take it to the next level is where the challenge was. Because a format can exist only if there are millions and millions of people who want to buy the titles. If you try to limit your market to people who are interested in high resolution only, this is really not a lot of people. You have to turn it into a mainstream format by providing features

and benefits that the main public can relate to, like the menu stuff, the pictures and surround sound—everyone can hear that it's better in surround sound, or at least it has that potential—but improving sound quality alone is not going to fly. If DVD-Audio had just been no pictures, two-channel,



Meridian G Series home theater.

higher resolution—it's even harder to sell that. And that's where SACD started. You know, better-sounding CD.

So yes, we wanted better audio quality, the music industry wanted a higher-margin product that couldn't be copied, Sony and Philips wanted to replace their royalty stream [from the CD patents]. These are all objectives which don't necessarily line up with what consumers want.

If there hadn't been a war, I think we'd have got a lot further. You'd think the industry would have learned that from Beta and VHS. You'd think they'd have learned it from Elcaset, DCC—there's a long list of things that Philips and Sony were involved in where they got this wrong. They got it right with Compact Cassette. DCC flopped, Elcaset flopped, Beta flopped. But CD was brilliant because it was one standard, at a time when the consumer could adopt it and could see real benefits.

Anyway, now here we go again with HD DVD and Blu-ray. Here we have formats which have been developed partly because the movie houses want to sell the content all over again, and partly because the manufacturers who developed DVD got their lunch taken away by the Chinese, and they want to develop something else that could be profitable for six or eight months before that gets taken away.

But there are all these different objectives being brought to the table. And in just the same way as the music industry said, "Well, in order to make SACD or DVD-Audio sell, we want still pictures and we want menus, we want this, we want that," the [film] studios are saying of these two formats—and the specifications are very similar between HD DVD and Blu-ray—that we have to

have all these bells and whistles. Things like, the players have to run Java so we can have animation and games working on the player, multiple streams so it's possible to play a disc and bring in the Icelandic soundtrack across the Internet and have it mixed in the player, or to play a disc back and be able to have alternate endings brought in off the Internet.

All these are kinds of features which, as a player manufacturer, make us think that it's impossible to test it! In fact, at one of the standards meetings I said, "Excuse me, do you think it's possible to have a specification that we can charge more for that has fewer features?" Because most of the consumers are not going to be interested in this. But it's all part of constructing something as a justification for its existence.

Now, high-definition video is better. You can't deny that. But we've shown you today how good standard-definition could be when it's rendered in a high-definition way. And a lot of high-definition content is lower quality than what we can achieve from standard. Plus the fact that although people have display devices that show high definition, they don't always show it very well.

So yes, there is a part of the market in America and Japan that will want high-definition sources. But I'm rather afraid that a large part of Europe will say, "Why do I want this? DVD is so good when I play it on my TV or my plasma, the picture's amazing, so why do I want one of these?" They are particularly not going to want one if there's a format war. Some studios are issuing on Blu-ray, others on HD DVD.

The time this was got right was when DVD came out. Because there *was* a format war. Do you remember MMCD and SD? They combined because Warren Lieberfarb, who was at that time with Warner, went to the two groups and said, "We're terribly sorry, but as a Hollywood group we've decided—and this is something they couldn't do these days, because of anti-trust—that we're not going to make any discs until there is only one standard. And that's really what's needed to happen. At this point somebody should have stood up and said, 'Guys. How many times are we going to make the same mistake?' Instead, it's like, 'How much money are you going to give my studio to support your format?' I'll probably get hung for that comment, but this is what we suspect happens."

I see this whole process as being highly risky, because in the background, China is developing a high-definition format all its own, and Microsoft has got a format. And by the time these guys have all done fighting, we'll be downloading the movie directly from a satellite or cable or whatever. There will be other methods for obtaining the material.

There's a really interesting survey that was done by one of the studios about why people buy DVDs. It was really trying to find out how important picture quality was and how important sound quality was, on this whole question of "Is there a market for a higher definition than what Joe Public thinks is fabulous? (Which is what he thinks of CD.)" And the answer was that, overridingly, the most important reason to buy a DVD was the movie. It was a film you wanted to watch. Second most important factor: price. Third most important factor: "How many times will I want to watch it? I won't buy if I'm only going to watch it once." Then



Meridian's flagship digital active loudspeaker, the DSP8000.

there's the actors, the producer, and all these things, and then, right down at the bottom, like number 50, is picture quality or sound quality! Is it Dolby or DTS? They couldn't care less.

That doesn't augur well, really. And talking among contemporaries, this is the view that most people are taking. This thing's going to happen, we're all going to wait and see.

Unlike with DVD-Audio and SACD, it's not only the consumers that are going to wait and see, it's the manufacturers and the dealers. We're not coming out with either player on the day the formats launch, and that's very un-Meridian. We were first with [audiophile] CD, we were almost the first with DVD, we had a DVD player within three months of Toshiba, we had a DVD-Audio player well ahead of the pack. Our SACD player remains an issue! [laughter]

HARRIS: But there must be some enthusiasts who are still waiting for it.

STUART: Not really. You know, we just don't get asked for it. The only markets in which SACD really is buoyant are Hong Kong and Holland.

Yes, in HD DVD and Blu-ray, we did our bit. We've attended all these meetings. We've made major improvements in the spec, things like arguing hard for what we call the visually impaired, which is really a way of getting past Hollywood all the navigation features you need to make sure that people who are visually impaired can use the disc, and that you can play back music in any way you want, with or without a screen.

By the way, the 808, our CD player, plays back DVD-Audio discs. You put a DVD-Audio disc in, it will play it back in two channels, no picture. The navigator understands that and goes straight for the content and just plays it back.

But coming back to HD DVD and Blu-ray, we also pushed for having a specification that was a perfect match to music. So they've both got at least 96kHz/24-bit—in the case of HD-



Faroudja DVP1080MF video processor.

DVD, eight channels, and Blu-ray will do the same thing at 192kHz. So you've got really-high-resolution audio. Because I felt that, okay, maybe one of these will succeed, and if it does it's going to eclipse the whole SACD/DVD-Audio thing anyway, because what we're

going to end up with is the CD and this new disc. And this new disc will be a carrier for music and a carrier for movies, and it's a unified format.

We really pushed for that—and we managed to get MLP into both specifications. Because my view was that it should be in, but also I hoped—and I still hope—that they might merge, and I wanted to be in both formats so that, when they merged, we would still be in. The specification's there, and that's what we contributed: we've done the encoders. We'll see.

The big thing we've got to work out is how to tell all the people who are loving music and downloading that there's more enjoyment to be had from that music when you listen to it on a good system. That's the audio industry's fundamental problem, because people believe that the download is CD quality. I love the fact that music is so popular; that's a great start. But then to sort of come down to the common denominator, that hi-fi is a speaker that you plug your iPod into... Everybody can hear good sound, if only they'll stop long enough to listen. They can hear the difference. And once they've heard it, there should be no going back. That's the message that we have to get across. Because the biggest message is that iPod isn't good enough.