

## LET THERE BE LIGHT

### HIGH DEFINITION CINEMATOGRAPHY IS BORN ANEW WITH THE GENESIS™ SUPER 35 DIGITAL CINEMATOGRAPHY CAMERA SYSTEM BY PANAVISION

BY JOHN FEINS

The new high definition digital camera system Genesis™ from Panavision is the result of many years of close collaboration with technology partner Sony. The camera combines high performance electronic imaging with world-renowned Primo® cine optics for unprecedented imaging versatility.

Finally, for the cinematographer, shooting digital means no compromise on depth of field control, portability, sensitivity, dynamic range or color. Because Genesis was designed from the beginning to be an integral part of the Panavision system, cinematographers have at their fingertips the vast array of Panavision's Academy Award® winning 35mm lenses and proprietary Panaflex® accessories that they have come to expect.

Genesis was designed with an electronic intermediate in mind, using a unique gamma and colorimetry that enables seamless intercutting with most 35mm film emulsions. The nominal ISO T400 sensitivity can readily be extended to ISO 1600 for low light situations. Shutter angles from 0.8 to 360° and frame rates from 1 to 50fps will enable further compatibility with Panavision's family of film cameras.

Genesis docks directly (top or rear) to the latest Sony HDCAM-SR™ digital field recorder, which ensures a totally portable package without cables to external recording or power. By cutting the cable, Genesis allows you the freedom to shoot 35mm digital cinematography anywhere your imagination takes you—Steadicam™, Technocrane™, hand held, underwater housings, car mounts, and more.

High Def 411 recently spoke with Panavision's Phil Radin, Executive VP Marketing, and Robert Harvey, Sr. VP Worldwide Sales.

What are the technological breakthroughs in the Genesis camera?

**Robert Harvey:** *The technological breakthroughs are designing a 24P camera that has a simple 35-size chip in it, a sensor that makes it possible for the camera to use all of our cinelenses—that is a major breakthrough—and the other breakthrough is you are not tethered to a recording system, it is all self-contained and the ergonomics of it are very much like a film camera. Genesis has 4:4:4 output and we like to say it is a film camera that happens to shoot tape.*

How much did you work with cinematographers in creating the camera?

**Phil Radin:** *Basically we worked the development of this camera in the same manner that we work all of our gear here at Panavision. The input of the cinematographer and the director is absolutely essential, from our standpoint, to create a product that will work properly and be to the liking of our users in the field.*

*All along the path, we have been developing high definition, along with our technology partner Sony for the last twenty years. So the Genesis camera is really the next generation of digital cameras that we have been working on and all of those cameras have been developed with the help of our clients who we really rely on to make sure we are doing the right thing and giving them a tool that is going to work in the field.*

In terms of the needs in the field, what are the differences in creating this high def camera versus other kinds of cameras?

**Phil Radin:** *The main difference, because this is brand new technology, is that there's a certain amount of education that needs to go along with the camera that you don't normally have to take into consideration with, say, a brand new film camera. When we introduce a film camera, for instance the XL, which was greeted very, very warmly, we have a lot of input from a lot of different people but it was not like having to reinvent the wheel or explain something that was totally foreign to a lot of people out there.*



Genesis™ by Panavision

*This camera itself functions very similarly to a 35mm camera in its ergonomics and the way that you set it up, where the follow focus goes, how the lenses mount—even the recorder looks like a magazine, and that recorder can be mounted on the top of the camera or the back of the camera either for studio work or hand-held work and steady-cam work.*

**Robert Harvey:** *It can also be tethered at the end of, say, a three hundred-foot piece of fiber if you want to put it up on a crane. You can keep the recorder down at ground level and you never have to lower the crane to change the tape. So that is a plus. You could not do that with a film camera.*

**Phil Radin:** *So from the standpoint of the ergonomics and everything, yes, we worked very closely with our cinematographer friends and director friends and assistants and operators and everyone, trying to give them all the benefits that they would associate with a 35mm system.*

*Where we've had to go beyond on this camera is that Bob Harvey, along with the Local 600, have been diligent in setting up workshops that have now gone on for the last four or five years: training the workforce out there—meaning the Local 600—to a new format that they might not have been exposed to before. We wanted to give them some basic understanding of the differences between imaging on digital as opposed to on film.*

*In the last five years we have had probably a thousand or so members of the Local 600 come through our facility for this type of training, both in the equipment as well as the basic type of technology of imaging on digital. In this way, they don't feel like they're out there without any basic knowledge and understanding of how the system works.*

On some of the online forums, end users discuss the differences to a trained eye between HD cameras versus film—shadow and highlight aspects for instance—and they are very impressed by Genesis' performance. How was this accomplished?

**Robert Harvey:** *First of all, let me say that as a trained eye is able to pick up the differences, for instance, between a filmed out Genesis piece versus the same subject shot on film—a trained eye*

could also pick out the difference between 5218 and another film stock. They would see the difference, even though it would be subtleties.

Having said that, if the film look is control over depth of field, what you have got here with Genesis is a video camera, for lack of a better term, that has the same depth of field as 35mm film. So you can do long focuses and you can do all the traditional things you can do with a film camera and that created a film look and also that creates an ability to intercut the tape with the film. We knew all that going in. We knew if we could create a camera that used a chip like that, we would have those features available to cinematographers.

However, we do not like to compare film to this. That is not what our business is. We like to offer the best of both worlds and let the creators decide what they are going to use. So we are a bit hesitant to answer questions that have to do with comparing.

**Phil Radin:** I think one other thing that Bob touched on earlier is also part of the answer regarding people who say 'It looks so much more like film now but we know it's digital.' From the standpoint of how that is achieved and created, it's really in the design of the super 35mm sensor that now exists in this camera versus in the previous cameras—three 2/3 inch sensors. The dynamic range of this camera is substantially higher than that of its predecessor and much more akin to what the dynamic range of what 35mm film is.

**Robert Harvey:** The bottom line is you put this in the hands of a cinematographer. Allen Daviau did the tests for us and they are magnificent to look at—both the filmed version and the Genesis version. I am sure you could make them look bad too! It depends on who is shooting it and how much experience they have with both formats. It is about lighting. It is about the cinematographer. Ultimately all of the products that we create are about the cinematographer—about the film user.

**Phil Radin:** The idea was floated around town several years ago, as the high definition products started coming to fruition, there was a lot of dialog along the lines of, 'Oh, these cameras are really wonderful, you don't need any light, you can just go into a room and turn it on and get beautiful images, you know, anybody can do it.' This is absolutely, totally and completely unwarranted. The requirement for a cinematographer shooting in any digital format, whether it is Genesis or the Panavision F900 or whatever, is still absolutely required. You still need an artist to create beautiful images.

I know a lot about cinematography but I cannot go out and light a set the same way Bob Richardson lit 'The Aviator.' This camera will not allow me to go out and play to that scene and turn it on and create images like 'The Aviator.' You need a professional person doing that. The camera is a tool just like any other tool. The user still needs to know what he or she is doing.

**Robert Harvey:** What we did was we made Genesis fit within a hundred year old infrastructure, which is film. So we took a video camera and just applied it to that infrastructure. We designed it around that infrastructure, which had not been done before.

What were the post-production considerations that went into this camera?

**Robert Harvey:** We are working closer with post-production houses than ever before.

**Phil Radin:** The workflow is a different process than what people are accustomed to using with film. I think one of the things that has occurred, and Panavision has been working jointly with various post facilities, is that as high definition has come into the marketplace it has demanded—both from the imaging standpoint, meaning us, and from the post-production standpoint—that all of the tools necessary to make that process work smoothly (and the process I am speaking of is taking the tape

from the camera, sending it to a post facility that can do color correction and go back to film and allow the editors still to work freely in an environment that they are used to) had to be created simultaneously.

So over the last twenty years when Sony first came out with the first three tube, high def camera, the process of both the imaging side and the post side have kind of grown up together, to where at this point there are a number of facilities worldwide that are very adept at dealing with high def material, high def tape.

That's good that the technology is bringing you closer together...

**Phil Radin:** I think it was absolutely necessary because everything that we were doing here obviously was going to have a huge impact on them, and in order to get somebody to use the equipment—if we actually wanted somebody to rent the gear—the infrastructure had to be in place. Nobody would rent the gear unless they knew that they could take a tape out of a camera and then either look at it on a television set or on the big screen.

So it meant telecine for television use and tape-to-film or digital-to-film for theatrical distribution. All of that needed to be dealt with between the companies that develop the camera systems as well as the post-production systems before we could actually go to a producer and say, 'Why don't you give this a try?'

Has this led to new products out of Research & Development?

**Robert Harvey:** Quite by accident we ended up developing a super zoom lens, a high definition lens. It is a 300 times, 7mm to 21mm based on the 2/3 inch chip. I am not sure that would've been developed had we not had the personnel here that understood that technology—and the reason that they were here is because we were in HD. So we are getting by-products from R&D. This new lens is quite something and it is an offshoot of what we were doing with the 2/3 inch chip cameras.

Are there new features that you can talk about that are under consideration?

**Robert Harvey:** We are talking about several things. We add features much the same way that the Panaflex film camera evolved. The DPs and cinematographers and crews use the gear and they come back with feedback about what they would like to see us do. Then we build the camera around their needs. That is a tradition at Panavision. We don't dictate. We try not to dictate to the field what they are going to use and what they need. We learn from their experiences.

What kind of feedback have you received from the field so far? Are there productions in the works?

**Phil Radin:** We've been approached by a number of productions to test this product. Because of the nature of a change like that and also because I cannot say that they have confirmed that they'll use it, I will just say that there have been a number of large, studio-type productions that are very interested in the camera. Suffice it to say that you will probably be hearing very soon about a Genesis job. We are deep into conversations with a number of productions about the use of this camera...

**Robert Harvey:** ...extremely high profile directors and cinematographers.

How about experiences at trade shows or experiences you have had with DPs?

**Phil Radin:** We showed the prototype of the camera about a year ago at Cine Gear. We showed the camera and we showed the test footage that Allen Daviau shot, that Bob referred to earlier, and the response was actually overwhelming: much, much higher and positive than we had anticipated. I think people were generally blown away by what they saw.

I don't think anybody was anticipating that this generation camera was going to make as huge a leap forward between what was previously available and what this camera brings to the table. The camera debuted at Cine Gear in '04 and we have been refining it for the last six to seven months and making changes based on some of the comments we've had from people who have been testing it for us. We are now very close to having production cameras out in the field.

How has HD changed your business and your vision?

**Robert Harvey:** Our vision has always been to design, develop, and manufacture the absolute state-of-the-art equipment that the motion picture industry could hope for. So from that standpoint, our vision is identical to what it was fifty-one years ago when we started. The changes that we've had to learn are in the electronic medium. We built a mechanical-based camera and now we're building a camera that's really run on electronics. That does things internally that we're really working hard to learn. That has been a change. The mantra at Panavision is 'give them what they want but make sure it is the best' and that has not changed—that is the same vision that we've always had.

**Phil Radin:** We've always been interested in bringing the best product possible in any formats to our users. The choice of what format to shoot in is dictated by artists that read material and decide what is the best way of conveying that story in a visual medium. So we still do feature films in super 16, we do them in anamorphic, we do them in super 35, sometimes we do them in 65mm although not as often as in the fifties, but it's still being done on occasion, and we now provide digital cameras, Genesis and F900s to do the same.

I hate to use a cliché but what Panavision did when we decided to do get involved in this business was we went out and we got the 'best and the brightest' of all of the people who were in the industry related to high definition. We told them what our endeavors were and we were very fortunate to get some incredibly talented, very, very smart engineers to help push this technology forward for us.

**Robert Harvey:** We made it clear that we did not want to learn their ways; they had to learn our ways. Again, it is a hundred-year old infrastructure we are involved in. I think the reason that we did so well right out of the chute was because producers and cinematographers and directors trust us to know how to do the project—it's not just the camera that they are using. There is a lot more to doing a movie or a television show than just applying the gear. We are a 24x7 house and we approach everything, whether it is video or film, the same way and with same vision.

Any comments about what is ahead in HD?

**Robert Harvey:** Just wait and see!

**Phil Radin:** I think what we can tell you, and obviously not disclose anything of a secret nature, is, as Bob mentioned earlier, in Panavision's development of film equipment. That's been a fifty-year process for us, starting with development of lenses and then cameras and coming to the fruition of the Millennium<sup>®</sup> XL camera, which is considered the best 35mm sync sound camera in the world.

We are just scratching the tip of the iceberg with HD now. I would say that of where we stand in terms of the development of HD technology would be akin to when Panavision came out with maybe our first 35mm Panaflex camera, the original Panaflex back in 1974, and that camera has gone through six or seven iterations since then.

So I would say that you are going to see quite a lot coming from Panavision, both on the digital side and we are still working feverishly on film-related product: optics for both digital imaging, broadcasting, and military use. There's quite a bit going on here in a number of areas that we feel very excited about.

How hard do you see the market swinging to HD or is that premature to assess?

**Phil Radin:** I think we are premature on that.

**Bob Harvey:** What we have created is a nice marriage between the two mediums.

**Phil Radin:** What we see right now is a lot of people looking at it for several purposes. Some people are interested in shooting an entire film or commercial in high def with the Genesis. Some people are interested in using it in tandem with 35mm film, either in principal photography or special effects.

We believe that this camera will have a big impact with special effects producers or visual effects supervisors. I think it's a marriage made in heaven now—with that industry having gone digital already—to be able to provide original digital information to them as opposed to providing it on film.

So I think it's like you say, it's still a bit early to tell but I think it's going to be across the board and we're going to have the use of film and digital being used collectively in the industry for some time to come. I don't think film is going anywhere real quickly and I think digital will be increasingly used. So we'll just see what happens.

High Def **4:4:4**

## GENESIS FEATURES:

- Super 35mm sized sensor
- Equivalent to 35mm depth of field
- Utilizes all existing spherical 35mm lenses, including PRIMO® Primes and Zooms
- Size, weight and ergonomics suitable for hand-held, studio or Steadicam™
- Utilizes many of the existing Panaflex® accessories
- Dockable Sony SRW-1 VTR (no cables)
- 1 to 50 frames per second
- 12.4 mega pixel, true RGB sensor (not Bayer pattern)
- Greater dynamic range than available digital cameras
- Nominal exposure index of 400
- 10 bit log per color output
- Wide color gamut for film intercut applications
- Dual viewfinder outputs
- Full bandwidth, dual link 4:4:4 HDSDI outputs
- Single 4:2:2 HDSDI monitor output
- Fiber optic camera adapter for off-camera control and recording
- Integrated lens control for focus, zoom and iris
- Camera control via Panavision RDC or Sony MSU, RMB series controllers
- Digital lateral color aberration compensation for improved visual effects
- Integrated display provides user-definable access to camera functions
- User-selectable menu terminologies (i.e., shutter angle or shutter speed)