the HD TIMES
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CBC's new HD service set to launch March 5

The CBC's first digital transmitters are tested and ready to bring High Definition television signals to the airwaves in Toronto and Montreal in early March. The CRTC's 'must carry' rules mean that cable and satellite providers serving the two cities will begin to carry the new HD services at the same time.

The Toronto transmitter is on the CN Tower and will carry CBLT and CBLFT—the Toronto feeds of CBC and Radio-Canada. Similarly, the Montreal transmitter will carry both the English and French networks.

Who can receive the new signals?

Most viewers will find the new channels through digital cable and satellite. In Toronto, Rogers Cable and Bell ExpressVu will carry service, although subscribers must have an HD-capable set top box connected to an HD-ready display.

It is possible to receive the new CBC HD service for free over the air, although the equipment is hard to find at the moment. You'll need a good set of UHF rabbit ears, or one of those big outdoor aerials of days gone by if you live further from the transmitter. You'll also need an HD TV set with a built-in ATSC tuner. The FCC in the US has mandated that all TVs over a certain size must now contain a tuner, so we can expect that in the future more big-screen TV's will come with tuners built in. It is also possible to buy a separate ATSC tuner box and connect it to an HD display, but these boxes are not yet readily available in Canada. You can also purchase a PC video card that will receive HD signals over the air. Rumour has it that this is the method used by none other than our CTO, Raymond Carnovale.

Unlike analog TV, the picture quality of the digital over-the-air signal is as good or better than cable or satellite. The nature of the digital signal is such that you either get it or you don't: you'll get either a crisp digital picture, or no image at all.

What programming is on the new HD service?

The English Service, CBC HD, will be the CBC Toronto feed, upconverted to digital. Where we have HD versions of programs broadcast on the regular schedule, we'll simulcast them in HD. Where we have letterbox (16 x 9 aspect ratio) versions of

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programs in standard definition, we'll broadcast those so they fill the screen on wide-screen displays. Although, this won't be true HD programming, it will look extremely good.

What about audio?

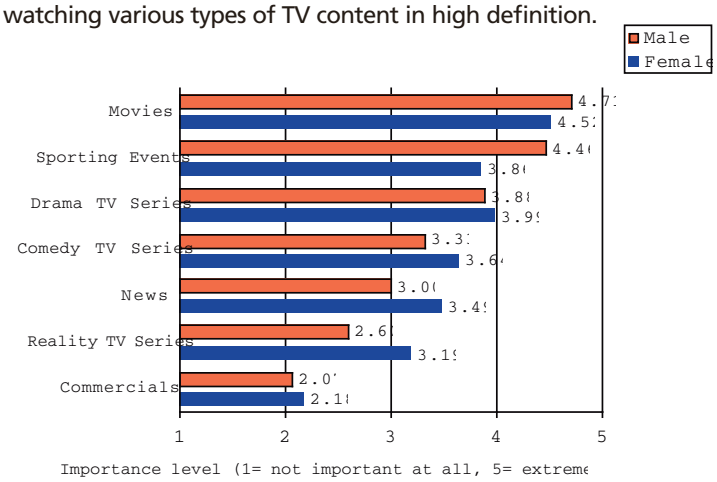
One of the biggest benefits of HD TV is 5.1 Dolby Surround Sound. Where we have program masters with 5.1 audio, we'll be able to broadcast home-theatre-quality sound.

How do I learn more about CBC's plans?

We are organizing an HD Symposium (See box on page 1) in the Broadcasting Centre on March 1,2 and 3 (Tuesday through Thursday). Sessions will be held in Studio 40 (10th floor) and in the 3rd floor conference center, and will include general overviews of the HD world, and more technical sessions on producing in HD. You'll hear from many of your peers who are actively working on HD. Check the intranet for session details.

Importance of Program Types in HD

Existing U.S. HDTV users were asked to rate the importance of watching various types of TV content in high definition.



Source: Lyra Research Inc. May-June 2004

Moving Forward

Some of CBC's top artisans share their experiences and insights on shooting in high definition

It's like turning the clock back 25 years for a DOP. "The picture has been ignored... [HD] "takes us back to the past high-quality images that were shot on 35mm film", says Michael Sweeney. Michael is a veteran cinematographer who learned his craft shooting in 35mm, a medium he fondly recalls as, "the original high definition".

The move to videotape-based productions in the 1960s created a different world for DOP's and the artisans who were used to working with the critical eye of the film camera. With the evolution of video the world of production changed. You had the immediacy of the image, it was cheaper to produce and the lack of high definition created a world where imperfections could be masked. Lighting was flat and less capable of creating a mood, the image was contained in a 4x3 box.

While the broadcast industry is looking at HD as the next evolutionary step in mainstream video recording, some artisans are looking at this new medium as return to the exacting standards of film production. What's clear: HD comes with a price and creates a new set of challenges.

What kind of obstacles are we facing in the HD Production world?

Budgeting for HDTV:
Paul Ames, Set Designer for the HDTV pilot "Getting Along Famously" knows firsthand how HD production can increase your costs. Paul estimated that it cost his department 35-50% more to design this pilot in HD than if it had been produced in SD. Some of the drivers behind those costs were the extra labour required to build sets and paint and reupholster furniture. "The biggest challenge that we had to work around was how to recreate a 1960s environment on a low budget when the camera picks up every nick and scratch on the furniture..." Ames describes the challenge of shooting HD from a Design perspective the "greater attention must be paid to small details." Ames admits that he had to make compromises and he's anxious to see the final cut to see how the fruits of his labour.

How do we have to think differently when shooting in HDTV?
HDTV is a wider format. Set design and staging may need to be slightly larger to accommodate the wider angle of view. The camera operator will have to be concerned with both 16x9 and 4x3 framing, depending upon the end market. The challenge is ensuring that the vital information is visible in both formats.

HD is unforgiving in its reproduction of images before the lens. Hair and makeup artists are finding that they have to search for new techniques to hide skin imperfections and aging signs

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on the talent. Linda Fruchtman is a veteran makeup artist who has been working with famous faces at the CBC for decades. She has heard about airbrushing and corrective makeup, both of which are being used by makeup

"HD is unforgiving in its reproduction of images before the lens."

artists in the US. The CBC has purchased some airbrush kits, however Fruchtman is skeptical. She would like to experiment with different options before committing to one. Airbrushing, mineral based makeup, which will work better? Fruchtman makes a good point that "in nature and sports, we're willing to buy the reality of the image". With anything outside of reality programming, documentaries and sports, it seems unlikely that the viewer will accept being distracted from the action because they're focused on the imperfections of the talent.

"HD camera manufacturers are aware that the clarity of the image is both a blessing and a curse"

Does it mean less close-ups and more smoke to soften the edge? In all likelihood, more time will be required to achieve the natural look in the new medium than was required in the good old days of low-res video format. This has always been the reality in film production. Many, hours are spent in the makeup artists chair before a frame of film is shot. In TV production, the timeline is tighter and adapting to the critical eye of the new format while being aware of the time constraints will tax everyone in the hair and makeup field. Lighting for HD can help to take some of the edge off of the sharpness of the image. Chris Germanakos, a Lighting Director with the CBC, compared the type of lighting required to shoot HD to the type of lighting used in film. For the many that started in this industry working with film, the switch to videotape for TV productions meant developing a new skill set, the same can be said about the shift to HD. Like anything new, there will be a learning curve, however the more experience you have the better the product.

No matter the challenges, the changing technology and ingenuity of artisans will eventually provide work-arounds. Kery O'Donnell, a video operator with CBC TV explains that there is a "skin tone detail correction that can be used to control the detail level of an actor's face". This is an important function because the "detail on a specific object or person may be increased or decreased without putting the whole scene out of focus". HD camera manufacturers are aware that the clarity of the image is both a blessing and a curse. This is why camera manufacturers like Sony have developed control system components for creative control.

There is an old saying that seems appropriate to the rise of the HD format...everything old is new again.

glossary

Current TV: approx. 480 scan lines,
HDTV: 720p, 720 lines, scanned progressively as in a computer monitor 1080i 1080 lines, interlaced (resolution of 1920 x 1080 pixels)
Interlace: two fields, even and odd scan lines, per frame.
Progressive: all vertical scan lines in one frame at the same time.

Downconverting HDTV to SDTV:
Material shot in HD can be 'downconverted' and stored as an SD image (Standard Definition) on Digital Betacam, SP, DVD etc. The quality of the downconverted SD image is affected by both the downconverter chosen as well as both the source and target format.

There is a specific HD format known as 24p which has been designed for optimum cross and downconversion flexibility to a number of formats including film and the 50 frame world.

Upconverting SDTV to HDTV:
To convert an SD image into an HD image you need an upconverter. This unit works by adding vertical and horizontal information to the standard resolution image through interpolation from adjacent lines and columns. The resulting image will still be short on the high frequency detail that would be obtained from an image shot with an HD camera. CBC will have the ability to upconvert programming not available in HD.

behind the HD scenes

Tim Rohal is a production switcher for Program Production Services at CBC television, The HD Times went behind the scenes with him at the World Cup HD broadcast this past September.

For those of you who don't know what a switcher is, it's best to leave it to Tim to explain: "As a switcher (a.k.a Technical Director or T.D.) for Hockey Night in Canada I work in the TV mobile. I sit beside the director, at a control console, which is also called a switcher. I execute the instructions from the director, physically pushing the buttons that allow the viewer at home to see any of the 22 cameras, 14 video playback sources or various graphic machines."

Having worked on the three previous CBC Sports HD broadcasts, Tim knew that the HD production of the "World Cup of Hockey" finals was going to be unique. The production team was working out of Dome Productions brand new HD mobile and they only had one day to prep.

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HD is on its way to the English Network Presentation Operations!

At the Canadian Broadcasting Corporation "High Definition" capabilities are beginning to take shape and English Network Presentation Operations is riding the crest of this wave of change.

Additional broadcast channels will be added to the existing complement of eighteen owned and operated stations currently integrated in the Network Control Centre on the sixth floor of the Canadian Broadcasting Centre in Toronto. High Definition programming will be delivered to the Broadcasting Centre as either a live feed from a High Definition mobile or on tape as produced material.

"Programming not available in high definition will be up-converted as part of the **CBC HD service**."

Programming not available in High Definition will be up-converted from Standard Definition format as part of the CBC High Definition service. All HD broadcast channels will have a unique playlist containing the entire elements of the broadcast day. Network Control Centre monitoring and our automation system will be reconfigured to handle the expansion of our services.

Coordination of live HD programming will be handled in the newly re-equipped Studio 26. This facility will distribute, simultaneously, a closed captioned HD program and a down-converted SD or "Standard Definition" version of the show. Hardware purchased for the coordination facility includes a Sony MVS8000A Multi Format Switcher System and Euphonix Max Air Audio Console that will accommodate both 5.1 audio and stereo mixes.

A Sony SRW 5000 HD VTR will be installed in our program transfer facility. This machine will be the playback source for High Definition material that will be 'ingested' to our existing Pinnacle servers. The "ingest" operation will have the ability to encode multi-format audio flavours and transfer the material as discrete audio tracks.

The Toronto Broadcast Centre's HD video distribution standard will be 1080i/29.97 format. The HD audio distribution standard will be eight discrete channels reserving channels 7 and 8 for DV or "Descriptive Video", a feature that provides audio commentary to describe various elements of a show for the visually impaired. At the end of the HD signal path a Dolby AC-3 Encoder that will encode audio for distribution

Training, theoretical and practical, has begun. This has included an overview of "High Definition" video and audio signal distribution and in-depth instruction on the use of the new hardware and software.

More news later as details are finalized.

coming up :

- HD Mobile
- HD Programing

continued : behind the HD scenes

The World Cup telecast was different from a normal "Hockey Night in Canada" broadcast because there were two separate versions of the game being broadcast simultaneously. One version was a high definition 16x9 ratio, and the other, standard definition, 4x3 ratio. CBC Sports decided to broadcast its "normal" non-HD signal in 4x3, or "Full Screen" because the picture would fill the screens of 95% of their viewers.

This is a decision that many producers have to face when considering that they have two audiences that will be watching the broadcast. Tim explains "the downside to the decision was that the ten HD cameras produce a wide screen 16x9 image and the sides will be cut off, leaving a 4x3 picture. The upside is that the older 4x3 (mostly remote controlled) cameras will look normal to the 4x3 audience. The wide screen HD viewers have an advantage of seeing all the 16x9 pictures from the ten new HD cameras, but they would see black bars on the sides of pictures from the old cameras."

What alternative could CBC have chosen? Tim suggests, "CBC could have decided to shrink the 16x9 picture into what's known as a 'Letterbox' picture to allow the standard TV's to see the full width of the 16x9 picture, but that picture would have black bars on the top and bottom. In this "Letterbox" format the older 4x3 cameras would have black bars all the way around the picture. That would not please most viewers."

Tim noted that there were many challenges in putting "The World Cup of Hockey" on the air in HD, but he credits the expertise of producer Sherali Najak, with reducing the pressure due to his patience and understanding. "As a group", Tim recalls, "we put on a show we all were proud of. [And] ...it helped that Canada won!"

HD BUZZ - Fred Mattocks

"High definition television offers producers and artisans new palettes, new landscapes, and new range for their work." It offers the opportunity to broaden the visual and aural horizons well beyond the constraints of traditional analog TV – it is, in some respects, a new art form. It offers producers, broadcasters and filmmakers a new and contemporary canvas to reflect the colour and complexity of the worlds around us."

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