Ryerson's Rogers Communications Centre Launches Worlds First Distributed 1080p IPTV Television Station

From: Office of Program Director, Operations and Technology, Rogers Communications Centre

May 1, 2009 – With the instillation of three additional SHARP AQUOS monitors in the Rogers Communications Centre, Ryerson became host to the worlds first distributed 1080p IPTV television station. The station that carries both RUTV --Ryerson University's Community Television Channel-- and Ryerson's Digital Signage Initiative is the first known operable distributed 1080p IPTV television channel in the world.

What makes the setup unique is that both its backend infrastructure and its IP based distribution technology have been built to 1080p standards. The station employs a variety of off-the-shelf technologies that have recently become available. Those technologies allowed Ryerson's Rogers Centre staff of Attila Jagodits, Bruno Boccia, Jeremy Littler, Kevin Cordick, Jim Loney and Brad Fortner to collectively design, assemble and install the network.

The system was built upon a Broadcast Unifying Gears (BUG) Television Master control system that is used to house content for RUTV. BUG TV operates out of a two-core Intel based Apple Xserve that plays either native or upconverted 1080p content out via a Matrox MXO. The HDSDI signal is then sent to a custom built multicore PC that contains a Windows Media hardware card that converts the HDSDI video signal to a Windows Media 9 1080p IP streaming media file.

The streaming media file is then picked up by a Harris Infocaster Digital Signage System and placed in the screen area reserved for RUTV. The Harris Infocaster Digital Signage system also displays information about events at Ryerson and plays out a 1080p signal.

Team member Attila Jagodits was assigned the task of distributing 1080p digital signage signal to four 1080p displays as well as down-converting the channel to NTSC for distribution on Ryerson's CATV system. In the end Jagodits decided to use YPbPr component video as the medium to get the 1080p signals to the displays. He found it to be the most cost effective delivery method available especially when a Gefen CAT 5 video/audio amplifier was employed.

"The Infocaster provides a 1920 X 1080 60P RGBS signal and stereo audio," Jagodits said. "I used a Gefen RGBS scaler to convert its signal to 1920 X 1080 60P component video. I then employed a rack mounted Gefen component video/audio distribution amplifier and ran CAT6 cabling to the LCD displays to ensure the bandwidth required for 1080P. At the LCD display panels, a Gefen receiver unit extracts the component from the CAT 6 cable and the component HD signal is fed directly into the display."

"For audio we used a Henry Engineering Matchbox to bring up the audio levels," Jagodits went on to say. "We then feed the audio through a FM systems limiter/compressor to ensure consistent audio levels and then the sound is processed by a Kramer audio delay unit to provide video/audio sync." Jagodits concluded. To control audio at the display location Hypersonic speakers are employed that are manufactured by HSS. Hypersonic speakers emit ultrasonic sound in a highly controlled, narrow beam, so that HSS can be heard only if you are "in the beam". The technology adds almost no ambient sound to the hallways in the Rogers Communications Centre.

To ensure energy efficiency and to ensure the displays don't get switched to other channels the displays are scheduled to power on/off and reset their input source several times during the day. For this an Extron RS232 controller is employed. The RS232 signal is extended to the Displays through Gefen RS232 extenders over CAT6. For Ryerson's in house CATV system an Ambery HD To SD Down converter is employed to generate an NTSC signal for distribution.

Ryerson Universities Rogers Communications Centre has been home to a number of innovations related to the development of HDTV. These include;

- 2000 – Perfecte, Canada's first student produced HDTV drama.
- 2001 – First 16*9 all digital educational TV studio in Canada
- 2001 – Housed Master Control for CDTV's Toronto Digital Test Transmitter. From it Toronto's first HDTV programs, data content and DVB terrestrial video are transmitted, received and tested.
- 2001 – Housed Canada's first tape based HDTV editing for which content was created for the countries first end-to-end 1080I broadcast in partnership with Vision TV.
- 2002 – Obtained seven HDTV cameras in schools and HDTV editing suites making it the largest HDTV implementation of that time.
- 2002 - Interactive Broadcast Learning Lab acquires ATSC data transmission and reception capability pre-dating ATSC Mobile by seven years.
- 2003 – Hosts Santa Fe High Definition Workshop, the first HDTV training of its kind in Canada
- 2003 – Opens two 1080i HDTV editing suites becoming Canada's first DVCPro 100 based non-linear editing suites employing Apple's Final Cut Pro software, Panasonic DVCPro 100 VTR's and stand alone storage.
- 2005 - Canada's first four-camera, High Definition TV studio is constructed. It's among the first fixed multipurpose HDTV production studios in North America.
- 2007 – Work starts on the HDTV Campus Wide Digital signage initiative using Harris Infocaster technology.
- 2007 – Cyradis Master Control replaced with BUG-TV for RUTV with eye on HDTV community TV Channel.
- 2008 – HDTV editing becomes mainstream. Enclosed HDTV editing suites become Canada's first educational facilities equipped with colour correction surfaces and grading monitors that span from HDTV through Digital Cinema.
- 2008 – Rogers Communications Centre co-hosts "4K Cameras, 4K workflows Conference" as the digital evolution shifts towards Digital Cinema.
- 2009 – Worlds first distributed IPTV 1080p HDTV networked launched to four displays in the Rogers Communications Centre. The effort combines RUTV and Ryerson's Digital Signage Initiative.

More information on the Rogers Communications Centre, the shared FCAD facilities it operates and the specifics of the labs that it operates can be found at **www.rcc.ryerson.ca/technology/index.htm**