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## **DIGITAL ENG: COMING FAST**

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It is likely that the trend to digitize the entire television process will reach forward from the TV station, just like it is extending beyond the station towards the consumer's home.



Upstream systems of a typical TV station include microwave ENG vehicles commonly used in Canada for news, sports and special event coverage. This part of a TV system is normally part of a station's "contribution" network.

When considering digitizing your ENG truck, many issues need to be considered. First, why bother at all? Analog ENG still does a wonderful job for electronic newsgathering. However, broadcasters appear to want more. Better utilization from their investment in expensive ENG vehicles is a reoccurring theme, as is their search at finding new ways to differentiate themselves from the local competition. Broadcasters want to use their trucks for more local, live-event coverage and Electronic Field Production (EFP) applications in off-news time frames.

EFP applications are beginning to include multi-camera shoots. Therefore, it may be desirable to pre-select source signals at the truck ahead of the main program switching that is occurring back at the station. So it would be helpful to have both a program and a preview feed sent from the truck to better enable the station production crew to manage the program flow of the show.

Digital ENG will permit two or more feeds from one vehicle in the same bandwidth that analog ENG uses for only one signal today. As well, audio and communication channels could increase and be greatly improved without being as troublesome as audio subcarriers are within analog ENG.

A quality signal is needed from either an analog or a digital feed. If digital feeds are desired, broadcasters need to consider MPEG-II formatted in 4:2:2, rather than 4:2:0.

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Also, since most material is subject to post-production or tight production switching and processing, there is a need to make use of I-frames only. In the distribution network, I-frames, P-frames and B-frames are used together. But P-frames and B-frames will cause trouble in switching, editing and when particular special effects are applied in a contribution feed. Some broadcasters may even consider non-standard compression formats, or variations on the JPEG format, for contribution feeds instead of the popular MPEG-II used in distribution feeds.

Once Industry Canada gains further insight of the user's requirements, they will likely make spectrum available that is better suited to this new digital approach. Questions remain about which modulation format will be best. So far options include QPSK, 8PSK, 16 QAM or even COFDM.

Efficient use of spectrum may not permit any spectrum recovery over analog due to the need to transmit a high-quality picture at a high-speed data rate like 15 MBits/sec or higher.

As Industry Canada works towards providing more spectrum for broadcasters, their challenge is becoming increasingly more difficult. Broadcasters want to try new applications like two-way links, multi-camera feeds, program/preview feeds, relay two-hop shots, helicopter live shots and much more.

Both Industry Canada and Canadian Broadcasters must also consider compatibility issues with the U.S. Concerns may include:

- A. Our use of spectrum in such close proximity to the border
- B. Easily sharing/reselling of news feeds
- C. Purchasing common products
- D. Bandwidth allocation and frequency plans, and adhering to new digital technical standards

All of these issues magnify by several orders of magnitude as soon as you move from a discussion on SDTV (4:3) towards one concerning HDTV (16:9).

Digital ENG is coming fast. The broadcast industry must carefully consider it's implications and help Industry Canada evolve a superior strategy that works well for everyone. Get involved now through industry groups like the CAB Technical Committee and the RABC.

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