

Digital Simulcast Overview

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System Overview

- **1050 lines, 2:1 interlaced, 59.94 Hz field rate**
- **1152 x 960 active pixels**
- **YIQ color (I and Q are half-resolution in H and V)**

Data Compression

- **Block-match motion compensation**
 - **16x16 blocks**
 - **forward and backward motion**
 - **very MPEG-like...**
 - **Y motion also used for IQ**
- **QMF subband coding for spatial and residue data**
 - **5 bands**
 - **Run-length and Huffman coding**
 - **Perceptually-weighted adaptive quantization**
- **Interleaved data streams for odd and even fields**
 - **like fields for motion**
 - **halves refresh time for robustness, tuning, etc.**

Terrestrial and DBS Differences

- **Channel characteristics are very different**
 - **DBS is 24 MHz, nonlinear**
 - **Terrestrial is 6 MHz, has co-channel interference**
- **BER conditions will be very different**
 - **DBS tends to have random noise interference**
 - **Terrestrial has random and thermal noise, as well as co-channel interference**
 - **more robustness needed in terrestrial**

ADTV and Skycable Issues

- **Channel modulation must be different**
 - **QPSK (phase modulation) for satellite**
 - **QAM for terrestrial?**
 - **QPSK is a subset, but higher speed**
 - **OFDM (multi-carrier) for terrestrial?**
 - **very different from QPSK**

- **Source Coding is a key strategic issue**
 - **QMF enables nested hierarchies**
 - **probably the technically superior solution!**
 - **TCE will gain intellectual property advantage**
 - **DCT is readily available technology**
 - **technique is widely known**
 - **chips are available from several sources**
 - **JPEG and MPEG are draft standards**
 - **will the momentum behind DCT prevail?**

ADTV and Skycable Similarities

- **Transport layers have no reason to be different**
 - **FEC (Reed-Soloman/CRC)**
 - **fixed length packets**
 - **packet headers**
 - **synchronization**

- **Error concealment strategies are closely related due to variable-length encoding and motion compensation**

Other Strategic Factors

- **ATRC can be a significant factor in DCT vs. QMF**
 - if we choose DCT, it creates industry concensus
 - but no digital hierarchy?
 - if we choose QMF, we gain
 - intellectual property advantage
 - a clear digital hierarchy strategy
- **Will Skycable influence the FCC or vice versa?**
 - FCC process is political and volatile
 - Skycable is a risky venture
- **What will MPEG II be?**
 - will it be scaled up MPEG?
 - will it be at all backward compatible?
- **What will Japan do about digital?**
- **The future will be different than we can predict...**