

ADV601TM



Analog Devices
Multiformat Video Codec

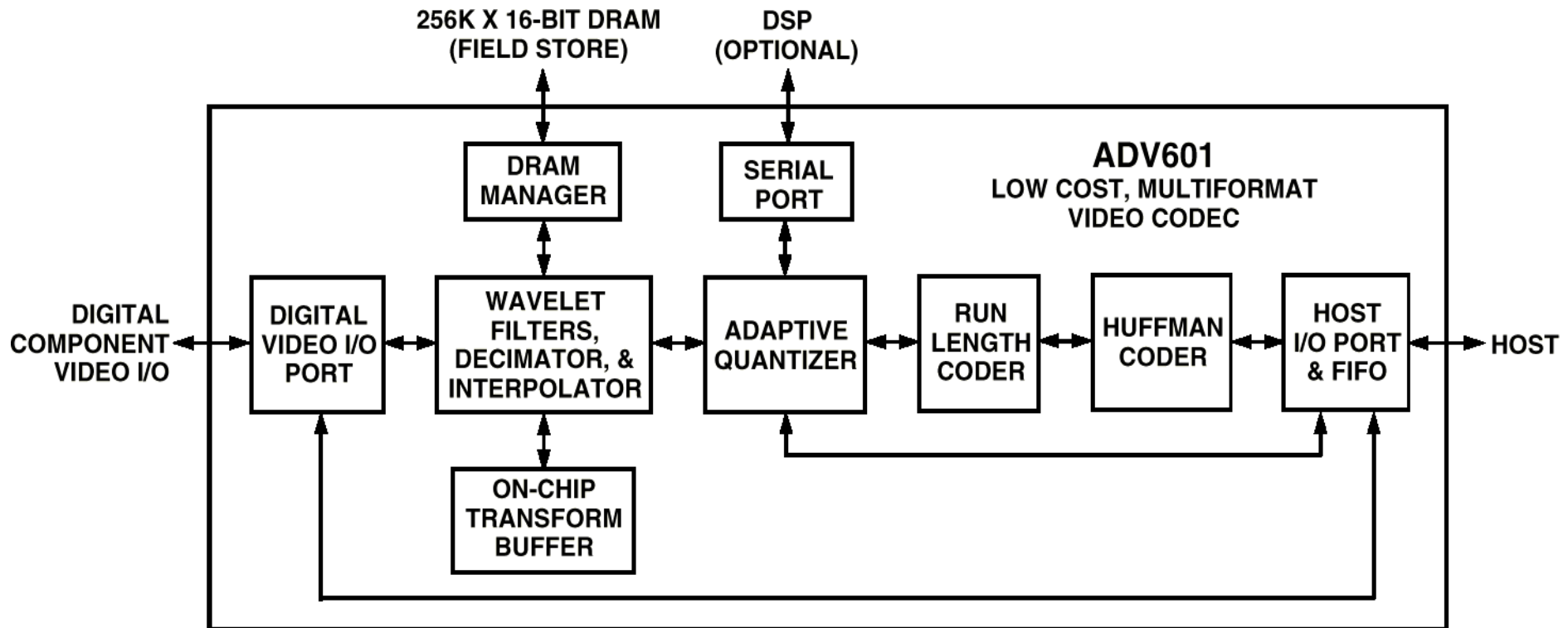
General Description

- A wavelets based, Single chip, dedicated for RT image compression and decompression of CCIR-601 interlaced digital video
- Glueless video and host I/F with on-chip SRAM
- Optional I/F to DSP for the quantization Bin-Width calculations (instead of the host)

Main Features

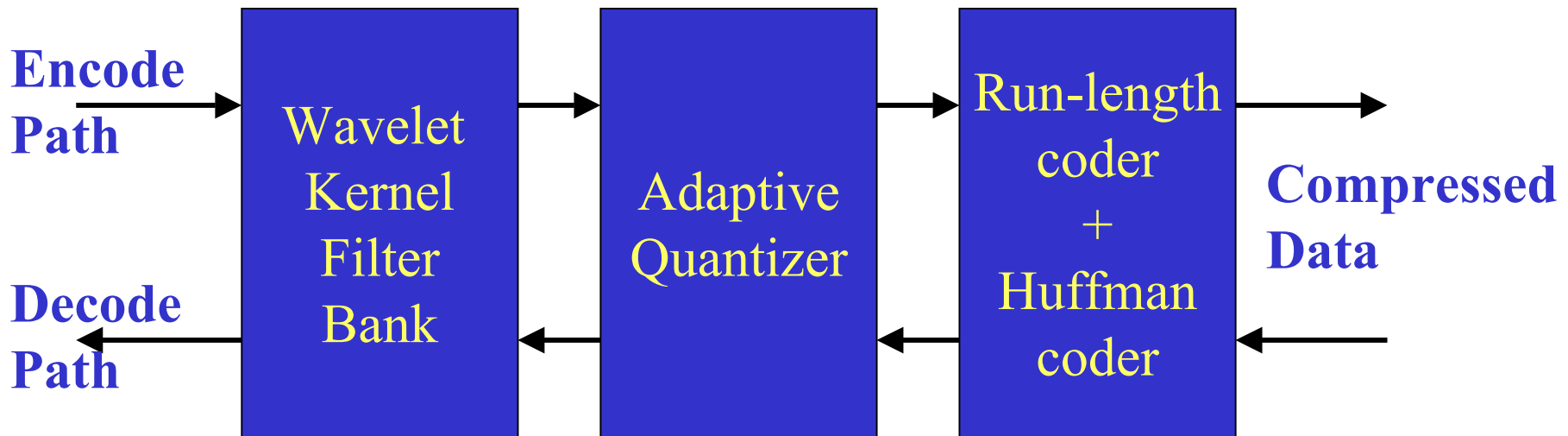
- Precise compressed bit-rate control
- Field compression
- Support for many common formats
- Upto 720x288 @ 50 fields /Sec (PAL) or
720x243 @ 60 fields /Sec (NTSC)
- Compression ratio upto 350:1 😊

Functional Block Diagram



General Operation

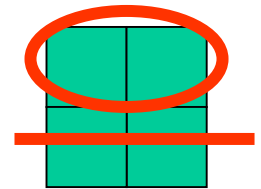
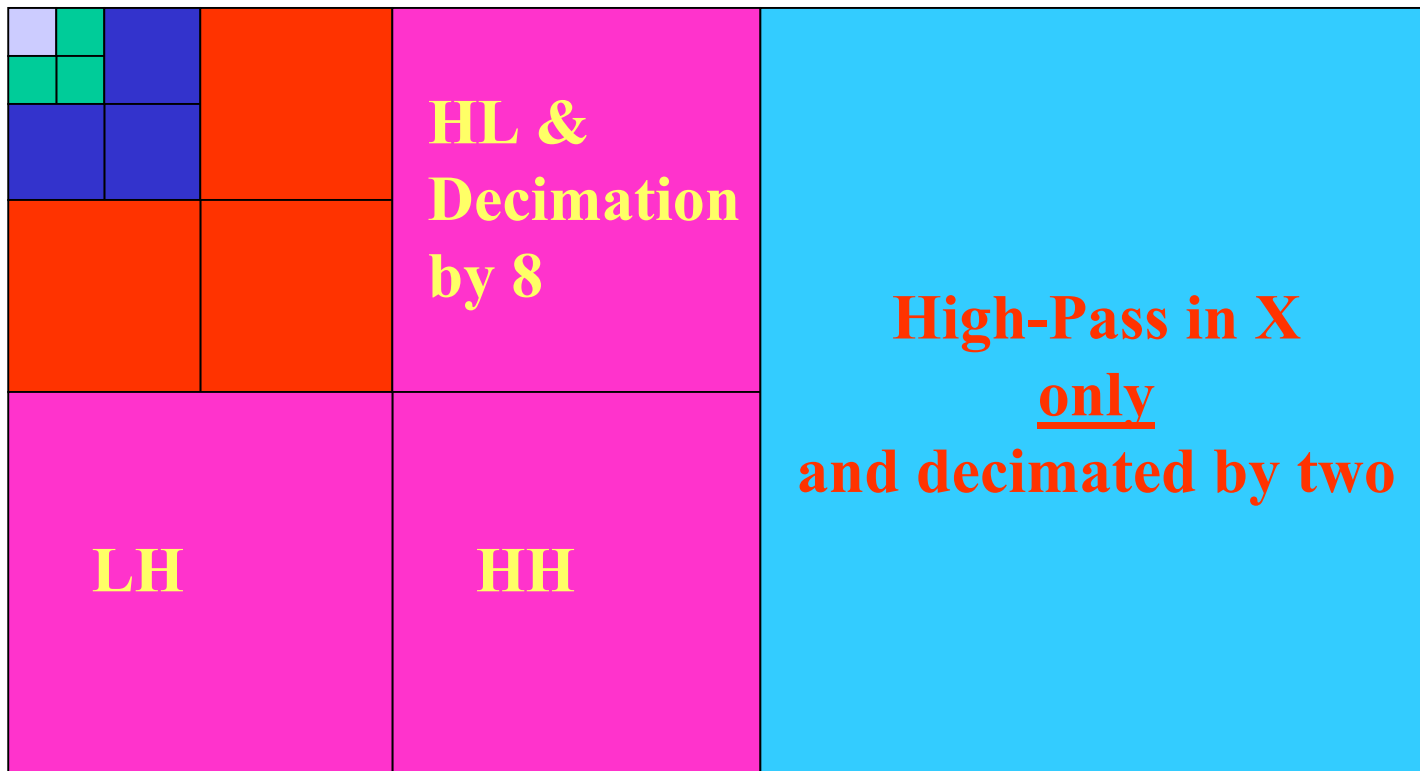
- Based on the **Bi-Orthogonal (7,9)** wavelet transform, with field independent sub-band coding




The wavelet kernel

A set of filters and decimators, that work on the image in both horizontal and vertical directions

A Modified Mallat Tree is used



Some important notes

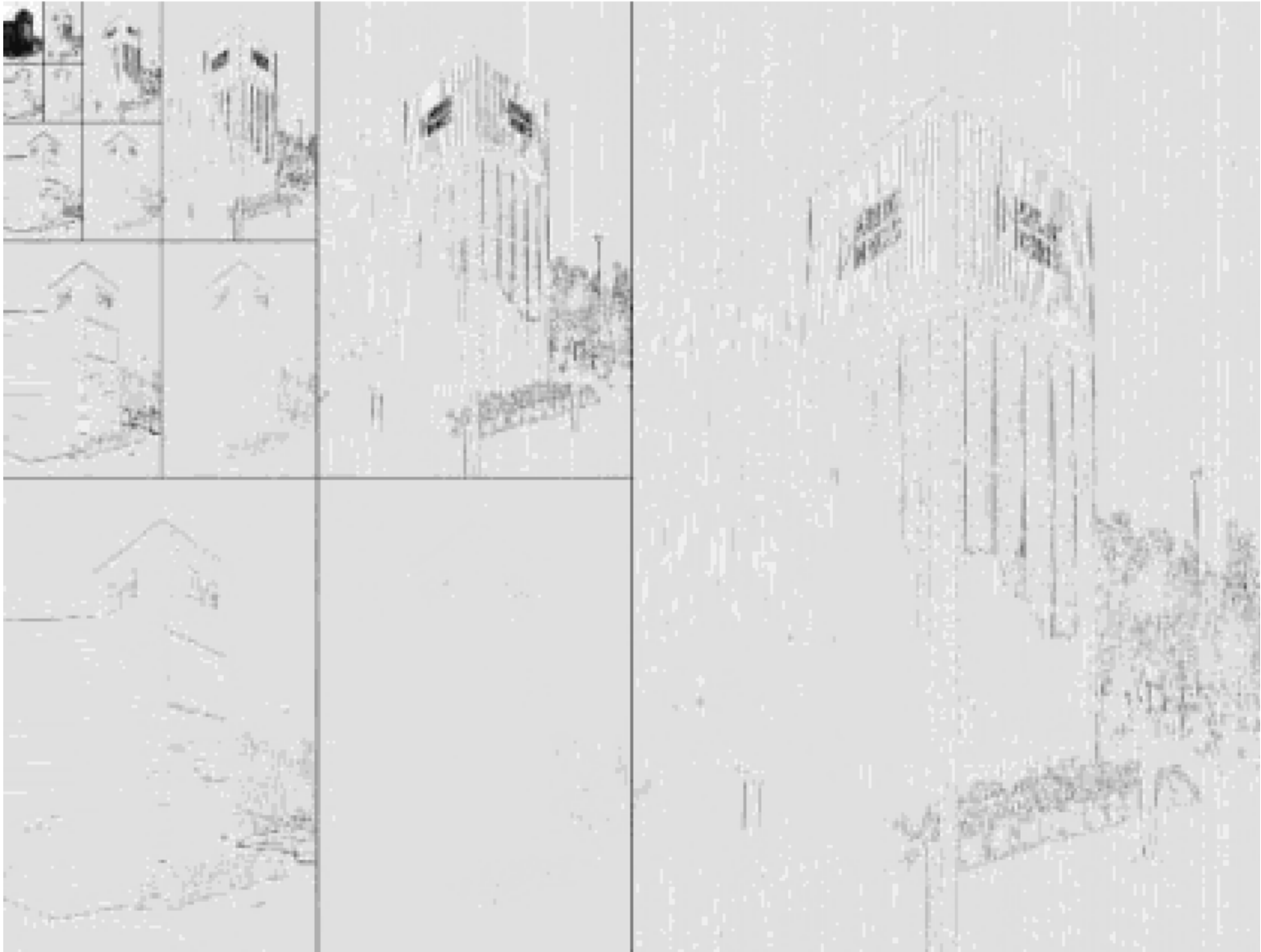
- The data in all blocks (except ) is **HPF**, so the pixels are Laplacian distributed with 0 mean
- The data in the blocks are more likely to contain strings of zeros
- HVS is less sensitive to higher frequencies than low ones, **And there is no HPF in Y in the first stage !**

Example: original image

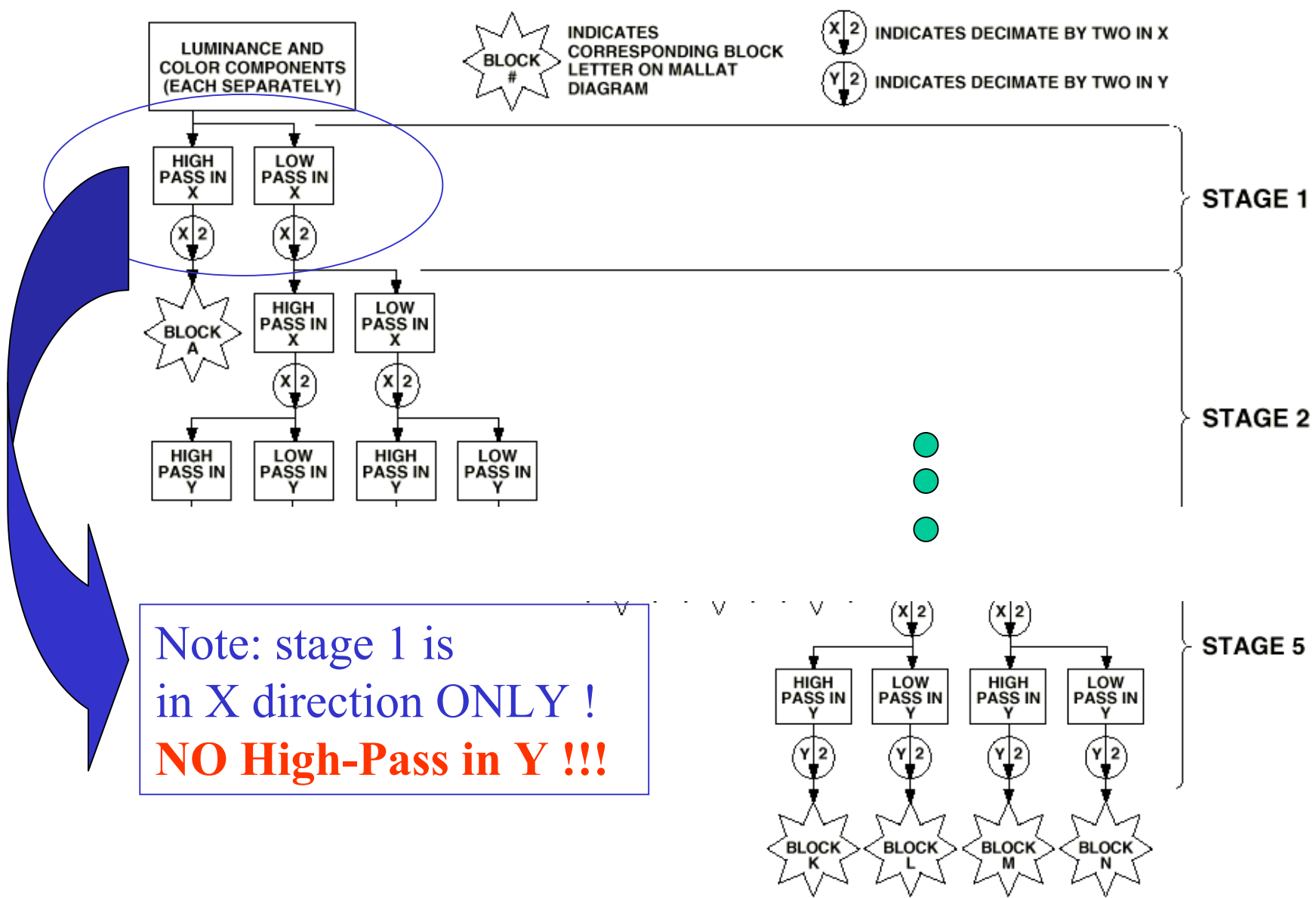
Analog Devices offices , Norwood MA



Modified Mallat of the Image

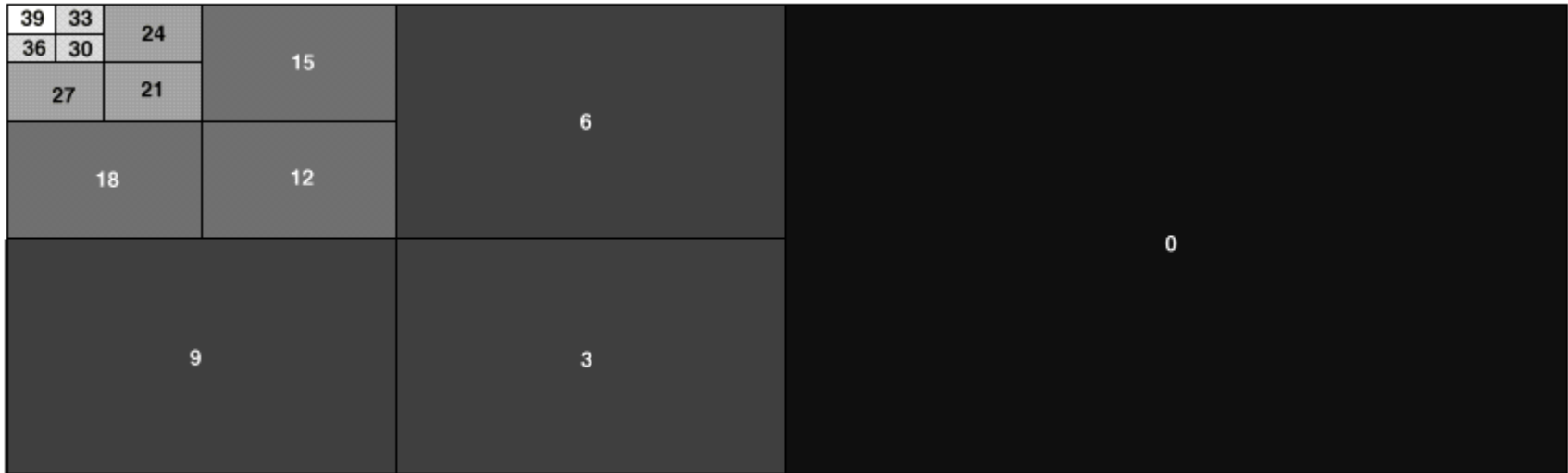


Wavelet filter tree structure



Quantization

- High frequency blocks receive **stronger quantization** (darker in the image)



* Same principal for the Cb/Cr components

Some real results...

“Visually lossless” ???:

Not at a high compression ratios...

Original image



“Mobile With Calendar”

ADV601 @ 15:1 ratio:

מריחת שפות
האפרוחים
לתוך המשטח
האחיד.



משטח
אחיד
המקבל
"גלים"

אזור עתיר
בשפות
קרובות,
הופעת
Mosquito
"Artifact"

A closer look

ADV601 @ 1:15

