

Janury 19, 1984

HEATHER COLOR OUTPUT SCALING

TWO MODES OF SCALING THE COLOR WITH INTENSITY INFORMATION IS

1. USE THE BUFFERED INTENSITY VALUE AS THE PULL-UP VALUE ON THE COLOR SUMMATION CIRCUIT.
2. USE THE INTENSITY BITS AS SWITCH TO SWITCH IN DIFFERENT RESISTER VALUES ON THE LEG OF THE COLOR SUMMATION LINES, IN FACT THIS MIGHT BE EASIER TO IMPLEMENT WITHIN THE HEATHER CHIP.

MAIN THING TO KEEP IN MIND IS THAT THE COLOR BURST MUST BE SCALED PROPERLY AND COLOR CARRIER MUST STAY WITHIN BOUNDS IN RELATION TO THE INTENSITY, WHICH WOULD HAVE BEEN EASIER TO ACCOMPLISH WITH LOOKUP ROM. WITH SCALING CIRCUIT SOME UPPER MAXIMUM LIMIT MUST BE ESTABLISHED FIRST THEN ALL THE OTHER VALUES MUST BE SCALED IN RELATION TO THAT SO THE DYNAMIC RANGE MIGHT BE A LITTLE SMALLER THAN CAN BE ATTAINED WITH THE LOOKUP ROM.

Let F_s be sample frequency for chroma
and F_s' be sample frequency for luminance

$F_s = 455 \times F_h = 5 \times 7 \times 13 \times F_h$;must be odd multiple of F_h

$F_s' = n \times F_h = n \times F_h$;must be even multiple of F_h

The constraint on n are as follows:

1. n must be an even number
2. n x Fh must be around 8.4 MHz
3. Fs and Fs' should be related with simple fractional multiplier

The above constraints will ensure that

1. comb filter will separate chroma and luminance
2. utilize maximum bandwidth for luminance
3. frequencies will be derived by simple PLL

Fs = 455 x Fh = 5 x 7 x 13 x Fh ;must be odd multiple of Fh
Fs' = n x Fh = n x Fh ;must be even multiple of Fh

Fs' = 6 x 7 x 13 x Fh ;Fs'/2 = 4.296 MHz little high
Fs' = 5 x 8 x 13 x Fh ;Fs'/2 = 4.091 MHz okay
Fs' = 5 x 7 x 14 x Fh ;Fs'/2 = 3.855 MHz okay
Fs' = 5 x 7 x 16 x Fh ;Fs'/2 = 4.406 MHz little high

If Fs is at the twice the chroma frequency of 7.16 MHz then the above
Fs' at 8.182 MHz can be derived as follows:

There is a slight problem with this derivation. If one looks at the
possible intensity frequencies.

$$FI_i = Fs / (2 \times i) ; i > 0$$

$$Fs' / 2 = 4.091 \text{ MHz}$$

$$FI_1 = 260.00 \text{ Fh}$$

FI2 = 130.00 Fh
 FI3 = 86.67 Fh (chroma)
 FI4 = 65.00 Fh
 FI5 = 52.00 Fh
 FI6 = 43.33 Fh (chroma)
 FI7 = 37.14 Fh
 FI8 = 32.50 Fh (chroma)

$Fs'/2 = 3.855 \text{ MHz}$

FI1 = 245.00 Fh
 FI2 = 122.50 Fh (chroma)
 FI3 = 81.67 Fh (chroma)
 FI4 = 61.25 Fh (chroma-lum)
 FI5 = 49.00 Fh
 FI6 = 40.83 Fh

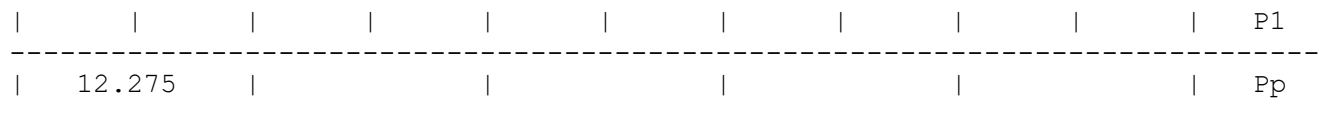
Some consideration to accomodate the square pixels.
 If Fs' is chosen to be 8.183MHz then have Fp set at
 12.275 MHz:

$Fp = 12.275 \text{ MHz}$

$Fs' = Fp \times 2/3 = 8.183 \text{ MHz}$

$Fs = Fs' \times 7/8 = 7.16 \text{ MHz}$

$Fc = Fs \times 1/2 = 3.58 \text{ MHz}$



	8.183																										Pi
	7.16																										Pc
																											P2