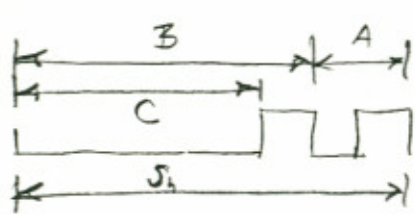


SP logic for UPC Decode 9-21-82 74

1. BORDER TEST SP USES 1.185 AS A BORDER TO CHARACTER RATIO. WHERE NS USES 1.125 TRUE RATIO IS 1.118.  
SP ALSO USES ANOTHER RATIO INTERNAL TO THE BORDER CHARACTER THAT REQUIRES A MARGIN OF 9,587 MODULES WORST CASE. NS ONLY REQUIRES 5,693 MODULES. ONLY 7 ARE GUARANTEED!
2. CHARACTERS ARE DECIDED USING APPROX. RATIOS, WITHIN 1% OF CORRECT RATIOS. NS USES EXACT RATIOS.
3. NO BLEED CORRECTION IS USED IN DETERMINING AMBIGUOUS CHARACTERS WITH SP DECODING.
4. SP CENTER TEST ONLY LOOKS FOR CENTER CHARACTER TO BE LESS THAN EQUAL TO THE PRECEDING CHARACTER ( $< 1/1.185$ ) NS USES HIGH AND LOW LIMITS. THE NS TEST IS MORE ACCURATE. REQUIRING THAT THE CENTER TO PREVIOUS CHARACTER RATIO FALL BETWEEN LIMITS AFTER 3 OR <sup>5</sup>6 EQUAL RATIOS IS QUITE POWERFUL FOR THROWING OUT IMPROPER FIELDS.
5. SP RATIOS REQUIRE WIDER WORDS & AN EXTRA ADD.

W=1 (MODULE=1UNIT)



SP RATIO  $B > \frac{16}{5} A = 3.2 A$

implies equality when  $A \leq \frac{16}{5} \cdot \frac{1}{2} \cdot \frac{1}{4} = \frac{4}{5} = 0.8$

$$\frac{B-E}{2+E} \geq \frac{5+E}{2-E}$$

$E = 0.2484$

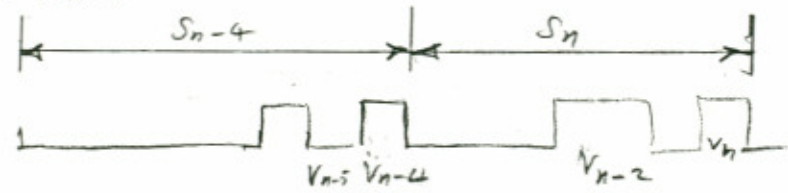
substitute E in above eqn

$$\frac{6.4-E}{2+E} \geq \frac{5+E}{2-E}$$

$B = 6.986$  MIN ← REQUIRED  $C = 5.986$   
 $A = 2+E = 2.2484$  MAX

$$\frac{6.986}{2.2484} \geq \frac{5.986}{1.7516}$$

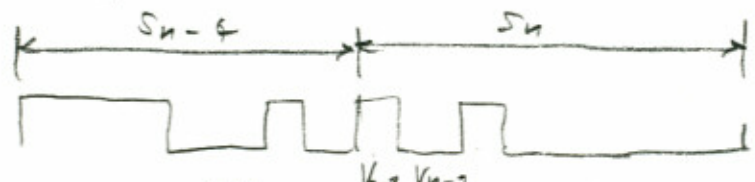
$\frac{B_{MIN}}{A_{MAX}} = 2.996$  vs. 3.2 FOR S.P.



IN MARGIN TEST

$$S_n < \frac{27}{32} S_{n-4} \quad \& \quad V_{n-4} \& V_{n-2}$$

$$\frac{32}{27} = 1.185$$



OUT MARGIN

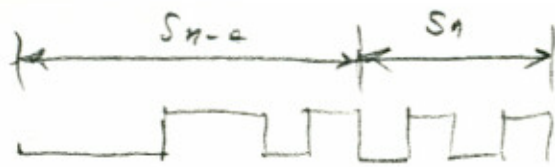
$$S_{n-4} < \frac{27}{32} S_n \quad \& \quad V_{n-3} \& V_{n-2}$$

S.P. MARGIN REQUIRED  $\frac{3.2}{2.996} \times 5.986 = 9.587$

doesn't meet out

N.S. MARGIN REQUIRED  $\frac{1.125}{1.178} \times 5.658 = 5.693$

actual worst case



SP CENTER  
TEST

9-21-82

$$S_n < \frac{27}{32} S_{n-4}$$

OR  $S_{n-4} > \frac{32}{27} S_n$

$$\frac{32}{27} = 1.185$$

$$\frac{7}{4} = 1.75$$

WITH TOLERANCE  
{ 2.047 }  
( 1.506 )

NS USES RANGE 1.5 TO 2.0