CRAY-2 Floating Multiply Concepts (Multiply)

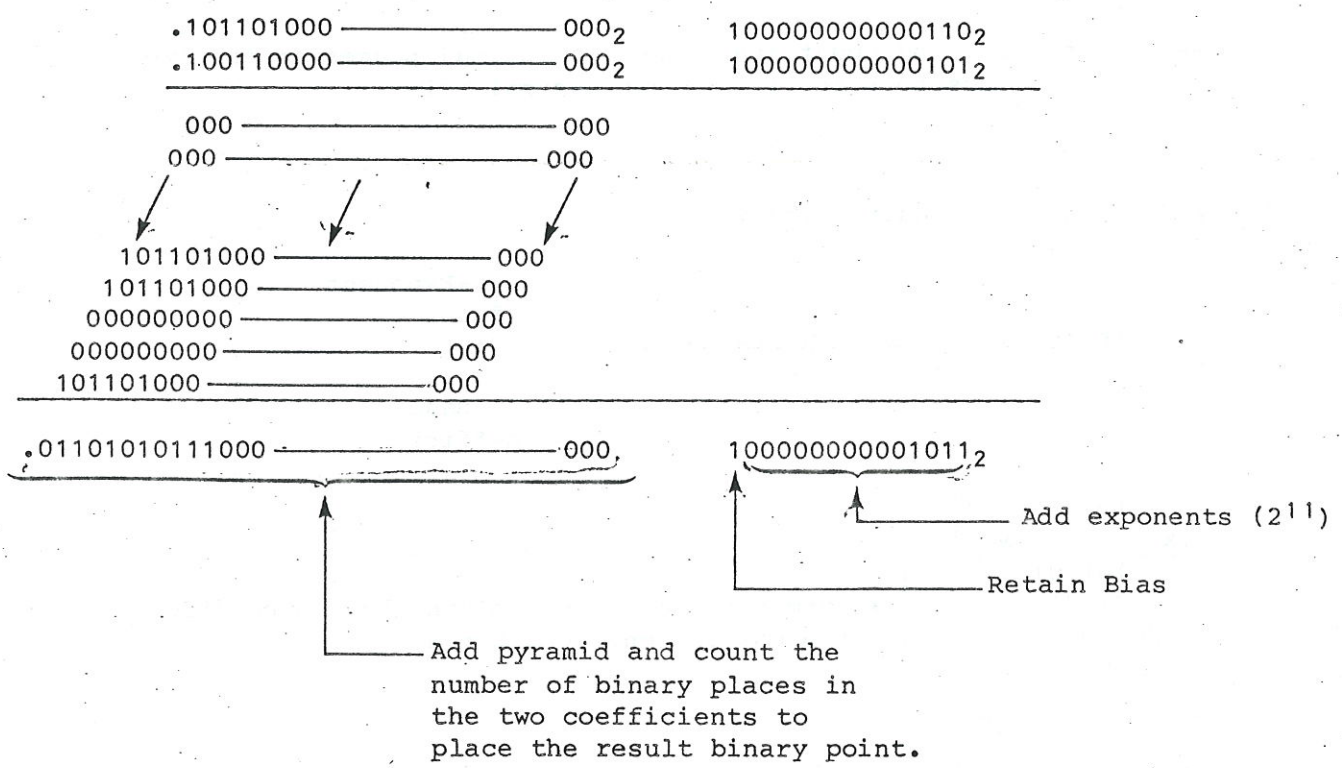
The CRAY-2 Floating Multiply Functional Unit provides for multiplication of scalar and vector operands in a scalar-scalar, scalar-vector, or vector-vector data arrangement. The operands received by the multiply unit are expected to be normalized values in Cray floating-point format. Unnormalized values will yield unpredicatable results.

Example:

$.101101_2 \times 2^6$ Multiplied by $.10011_2 \times 2^5$

$.101101_2 \times 2^6 = 040006.132000\ 000000\ 000000_8$ (Parcel Format)

$.10011_2 \times 2^5 = 040005.114000\ 000000\ 000000_8$ (Parcel Format)



Since the multiply unit always receives normalized operands the normalization process involves only two cases. The result is either already normalized or the coefficient must be shifted to the left one place. In our example the coefficient has to be shifted to the left one place. Shifting the coefficient towards the binary point is effectively increasing its value. To compensate for this the exponent needs to be decreased by the amount of the shift. Therefore, we subtract one from the exponent to yield the following result:

$040010\ 152700\ 000000\ 000000_8$ (Parcel Format)