VA Module General Description

The VA module contains the Vector Integer Add Functional unit and the logic for the Compress Iota Function. The VA module combines with the VB module to make up the Vector Integer Functional unit. The VA module receives Vector and Scalar data directly from the VR modules. All data sent back to the VR modules is merged, on the VB module, with data from the VB.

VA Module Compress IOTA Concepts

Compress IOTA Function Instruction Summary

176ijk Enter Vi with compressed Iota Sj and Sk
177ijk (same as above)

The VA module handles the Compress Iota function, then is initiated by a 176 or 177 instruction. The Compress Iota function forms a Vector register from two Scalar operands.

The VA receives scalars Sj as a mask and Sk as a stride value. The adder on the VA is used to continually add Sk to itself and present values to the VR modules that are in increments of this stride value. The data corresponding to the first possible write to the vector register is blanked on the VA. A new data value is presented to the VR modules in each succeeding clock period. These values are in increments of the Sk stride value.

Although the data is presented to the Vector register each clock period, it is not written unless the VA module sends control to the JC module to allow the write. The VA module controls the write through an advance signal to the JC module. If the JC receives an advance it presents an address a Go Vector step to the VR's. This causes an element to be written. The JC will then increment the vector register address in anticipation of the next write. The Sj mask value is tested to determine if a Vector register element is to be entered. The VA looks for set bits in the mask starting with mask bit 63 and testing bits in descending order in sequential clocks. A vector element is entered if a bit in the mask is set. The data corresponding to that mask bit is an increment of the Sk stride value. The mask bits correspond with stride values in the following manner:

Sj Mask Bit	Sk Stride
63	0Sk
62	1Sk
61	2Sk
60 ↓	3Sk ↓
0	63Sk

C0029S0401