LOCAL MEMORY

There are 16384 words of local memory associated with each background processor. Each word is 64 bits in length. This memory is treated as a register file to hold scalar operands during a computation period and then return the data to the common memory. The local memory may also be used for temporary storage of vector segments where these segments are used more than once in a computation in the vector registers.

The local memory is organized into four banks of 4096 words each. Each bank has its own address register. All four banks share a data write register and a data readout register. A scalar reference initiates all four banks at the same clock period. The proper bank is then sampled to the readout register four clock periods later for a read reference or the write strobe is enabled to the proper bank for a write reference.

Vector references to the local memory require one extra clock period for address setup. This is to allow an arbitrary starting point for the vector stream. The bank address registers then advance sequentially for the length of the vector stream. Data moves at the rate of one word per clock period in a vector mode.

The local memory is reserved at instruction issue time in the same manner as a functional unit. The reservation has a four clock period duration for a scalar reference. The reservation has a duration of five clock periods plus the vector length for a vector reference.

LOCAL MEMORY INSTRUCTION SUMMARY

044i-- Enter Ai from constant local memory address
045--k Store Ak into constant local memory address

046i-k Enter Ai from local memory address Ak
047-jk Store Aj into local memory address Ak

Sign extended on store

054i-- Enter Si from constant local memory address
055-j- Store Sj into constant local memory address

056i-k Enter Si from local memory address Ak
057i-k Store Si into local memory address Ak

074i-k Enter Vi from local memory address Ak
075i-k Store Vi into local memory address Ak