ROSEBUD Interface Routines

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The interface routines to ROSEBUD enable the user to initialize ROSEBUD, load a data pattern to be sent over the fiber optics, determine the trigger token to be sent, and determine when the event is sent. The user visible functions are the following:

STATUS initializeRosebud (u_int a32Address)

Arguments:	u_int a32Address	VME A32 address at which to configure the ROSEBUD event memory
Globals:	SEM_ID rbSem	Binary semaphore to indicate end of event. Given by ISR attached to "event finished" interrupt

initializes ROSEBUD hardware;
sets A32 address at which the ROSEBUD event memory appears to "a32Address";
initializes a binary semaphore rbSem to empty;
attaches an ISR to the "End-Of-Sequence" interrupt, which gives "rbSem"
enables "End-Of-Sequence" interrupt

STATUS loadRosebudPattern (int patternNo, u_int startPattern)

Arguments:	int patternNo	Index for pattern to load
	u_int startPattern	The starting point for the different patterns

Fills the ROSEBUD memory with a pattern to be transfered when an event is requested with "triggerRosebud" (see below).
Currently the following patterns are available:

Walking 1 (patternNo = 0)	consecutive fiber words increase the bit position of the bits in the "startPattern"
Tag word (patternNo = 1)	each fiber word is filled with the same "startPattern" tag word
Alternating Tag word (patternNo = 2)	consecutive fiber words are filled alternating with the tag word and its one's complement
Increments (patternNo = 3)	consecutive fiber words increase by 1 from the "start pattern"

Additionally, the fixed words (detector number, tag word, trigger command, daq command) in the header are filled.
The header words as well as each control word will be followed by NUM_WAITSTATES empty cycles to comply with the interface document (NUM_WAITSTATES is 5 for 50 MHz or 6 for 60 MHz operation).
In order to make aligning of patterns to the 20-bit fiber words easier, the 20-bit fiber words are constructed from 32-bit data words by using the lowest 10 bits of the least significant 2 bytes and the the lowest 10 bits of the most significant 2 bytes and concatinating them.

void triggerRosebud (short token)

Arguments:	short token	the 12-bit trigger token to be put in the header

The “token” is placed in the appropriate place of the event header and an event transfer is requested from ROSEBUD. The end of transfer can be sensed by “taking” the “rbSem” binary semaphore.