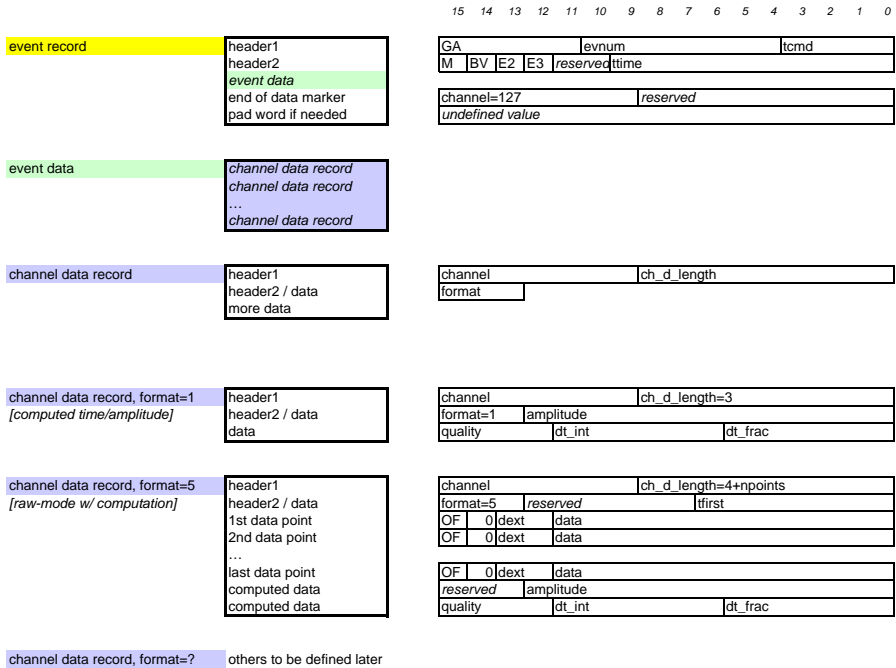"125MSPS F"ADC data format
PRELIMINARY
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Note: 1. everything is entirely based on 16-bit words. Of course 32 or 64 bit VME accesses can/will be used for readout.
2. A block header/trailer is not defined here. This can be added if required, it has not much impact on the data volume or anything else on-board.

		15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0	
event record	header1	GA evnum tcmd	slot / event number (local scaler) / trigger command nibble
	header2	M BV E2 E3 reserved ttime	M bit (=0 if empty, =1 if data follows) / error bits(prior busy violation, err2, err3) / trigger timestamp (local scaler)
	event data		this is a variable length list, 1 to 128 channel data records (defined below) = 2 to 65536 words
	end of data marker	channel=127 reserved	this has same format as channel data record header1, but "channel number" is 127 here
	pad word if needed	*undefined value*	0 or 1 pad words to ensure that event record is a multiple of 4 bytes, undefined value (e.g. do not assume it is zero)

event data	*channel data record*		this is a variable length list, 2 to 512 words
	channel data record		this is a variable length list, 2 to 512 words
	…		…
	channel data record		this is a variable length list, 2 to 512 words

channel data record	header1	channel ch_d_length	channel number / channel data length count (words, including this one, i.e., add to current word index to skip to next channel)
	header2 / data	format	format code
	more data		variable length list, 0 to 510 more words; may be fixed length for some formats of course
			NOTE: channel 0-71 correspond to input channels; others 72-126 are reserved for inserting other data items, e.g., interpolated cathode positions
			NOTE 2: If "channels" 72-126 are used, they may be used repeatedly. There will be at most 128 "channel" data records.

channel data record, format=1	header1	channel ch_d_length=3	channel number / channel data length count (words, including this one, i.e., add to current word index to skip to next channel)
[computed time/amplitude]	header2 / data	format=1 amplitude	format code / computed amplitude (13 bits)
	data	quality dt_int dt_frac	quality bits (e.g. chisq of fit) / integer part of computed time offset from trigger (range 512 ns) / fractional part of computed time offset from trigger (resolution 125 ps)

channel data record, format=5	header1	channel ch_d_length=4+npoints	channel number, channel data length count (words, including this one, i.e., add to current word index to skip to next channel)
[raw-mode w/ computation]	header2 / data	format=5 reserved tfirst	format code = 001 / first data point time offset from trigger (range 1024 ns)
	1st data point	OF 0 dext data	overflow bit / data bits 13-12 (for testing w/ 14-bit ADC) / data bits 11-0
	2nd data point	OF 0 dext data	
	…		
	last data point	OF 0 dext data	
	computed data	*reserved* amplitude	computed amplitude (13 bits)
	computed data	quality dt_int dt_frac	quality bits (e.g. chisq of fit) / integer part of computed time offset from trigger (range 512 ns) / fractional part of computed time offset from trigger (resolution 125 ps)

channel data record, format=?	others to be defined later		

example datastream: empty event followed by an event with 4 hits (channels 13,14,15,70) and then another empty event
note: time values here assume sample clock was 125 MHz

0x1801	event=0
0x8023	ttime=280 ns, empty event
0x1811	event=1
0x007d	ttime=1000 ns, non-empty event
0x1a03	ch=13
0x2357	amplitude=855
0x0388	dt=113 ns, i.e., pulse time = 1000 ns - [LATENCY_REG] + 113 ns
0x1c03	ch=14
0x37e5	amplitude=6117
0x038f	dt=113.875 ns
0x1e03	ch=15
0x23c1	amplitude=961
0x037d	dt=111.625 ns
0x8c03	ch=70
0x207b	amplitude=123
0x09e4	dt=316.5 ns
0xfe00	end of data
0xbeef	pad word
0x1821	event=2
0x81dc	ttime=3808 ns