firmware/software/DAQ todo list

• implement and test swapping SPI to MIO mode and bitbanging second ADC on carrier
  – bit-bang SPI code does not work for the ad7689 for some reason; need to compare to what peripheral is doing with scope and mimic that more closely
• already have code to detect carrier revision (via mio36)
  – want to put carrier rev# in high bits of 0x3811, etc; should be used to ignore data from carrier ADCs; may cause problems unless it's masked out everywhere else it's used
• implement max FPGA current measurement registers on scrod
  – all on XADC; shouldn't take long; something similar already done for asic I and all temperatures
• implement and test carrier clock divider code with new spi bitbang mode code
  – otherwise, have ~duplicated code; a pain to detect whether it worked; but doing so might help identify bugs in bitbang code

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- implement and test "if temp>80C, turn vbias/vbias2 down and/or shutdown amp/asic regulators and set a flag in the data"
  - not difficult to implement; should be fun to test the feature!
- switch i2c code away from needing interrupts
  - might help avoid missed data from PL
- add signals from PL to PS to tell scrod how many carrier links to check for
  - should be simple/quick; would help with the annoying extra-5-second bootup time on short stacks
- parameters found via Pitt testing are not reflected in what is programmed into the DDR controller
  - we're just using the defaults AFAIK; may feed into the previous point about which SCRODs really have "bad" RAM
firmware/software/DAQ todo list

- change linker script so SCROD PS code is run from OCM; otherwise we have everybody trying to access DDR for *everything* and OCM is otherwise unused
  - should not be difficult; a previous version did this
- rewrite the parts of ps7_init that we need in a small c function that is loaded in OCM as a sort of "first-stage bootloader"
  - mostly so we can boot up without loading a tcl file while programming, which will make the FTSW tree JTAG programming work "out of the box"; also partly because we have ~10 "bad" SCROD revB2 boards on which the RAM doesn't work
- make num_windows_per_wave a variable that is used in PL and PS code so we can change it on the fly
  - we're not exactly converging right now whether it should be 4 or 16 in the repo and it might be useful to have it runtime-settable so we can test arbitrary pairings of scrod-bitfile-x with carrier-bitfile-y
firmware/software/DAQ todo list

• implement nsm2 way of controlling FTSWs and programming boardstacks
  – to avoid carpel-tunnel while programming 64 boardstacks' worth of elf files
  – already done-ish with jtagft? but we have to move toward using b2daq machinery
• implement nsm2 way of controlling boards
  – DAQ group already has something like this, but need to do some work here; couldn't do a git clone of the belle2 repo when I tried and the svn checkout I have is now old...
• implement b2daq/python way of reading/writing registers
  – no more calls to reghs(x) binary; might help us avoid additional reasons for deadbeef
• implement and test setting up timer to poll to tell us when to do i2c and spi calls
  – so they don't necessarily happen every time through the loop
  – need to spend some time with the TTC timer/counter part of the TRM; might be useful for other purposes: how many waveforms per second are we processing, etc

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- put a (b2l-controlled) boardstack in the temperature chamber and do some I-as-a-function-of-temperature scans
  - would be fun; might be good to have for datasheet/paper on ASIC
- measure timing resolution as a function of vbias/vbias2 using pulser station
  - I generated a plot of current as a function of vbias/vbias2, so knowing how timing depends on these would tell us the range we can work in if the temperatures get too high
- change python code to call read and write functions instead of having them be b2l specific; only lowest level wrapper must know about interface
  - feeds into the above point above about using b2daq machinery
- remap everything in gigE to the same address space as b2l so we can switch back and forth
  - might help find some bugs