Development Path for Supercam's Bias System

Pick two ADCs
-- One will be a good ADC for multiplexing
-- The other will be very high accuracy ADC.

Evaluation Board System

Use an evaluation board for the (or ADCs)
Fully enclosed in a grounded box.
Explore operation of ADC
Use "Super Cool" microcontroller development board to communicate with ADC and develop microcontroller requirements.
Learn how to make the ADC quite to the incoming signals.

Chose ONE of two ADCs

Digital Board

Opto-isolated digital outputs for control of Bias cards.
Can turn the digital system off on/ off in reasonable time
Two ADCs to work out triggering and basic layout issues
Accepts all signals from analog bias system.
Design so that it can be operational while the bias box is operational.
Fully enclosed in a grounded box. (if needed)
Use Sierra Proto Express's 4 layer NOTouch PCB process for 3 boards for $153

Continue? — Yes / No

Prototype
Analog Bias with Integrated Digital Monitor and Control

1 Channel that can be easily switched between all 3 bias functions. (SIS mixer, magnet, and LNA)
Full control/monitor of the bias from onboard micro controller.
Can turn the digital system off on/off in reasonable time
Design so that both are fully operational at the same time.
Two ADCs to ensure that grounding issues are taken care of
The entire analog system will be completely completely enclosed in a shield. (if needed)
Use Sierra Proto Express's 4 layer NOTouch PCB process for 3 boards for $153

Continue? — Yes / No

The "Cool System"

One card for one row of array.
Each card is independent
Bias system lives on the same board as the digital
Full control/monitor of the bias system from onboard micro controller.
Both are fully operational at the same time.
Can turn the digital system off on/off in reasonable time
All signals for the bias box go directly to the PCB
ADCs pairs to capture voltage and current at the same time.
Each Bias circuit can be easily switched between all 3 bias functions. (SIS mixer, magnet, and LNA)
The entire analog system will be completely completely enclosed in a shield. (if needed)

Use it? — Yes / No

Build the Final System

Digital System

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Analog System

Unify SIS LNA MAG Boards

Build Desert Star "Clone" for 1x8 tests

(Testing)
Use Digital Board to read Biases.

Digital board replaces PC 104 system — Yes / No

Make 8 Digital boards that will fit in final design

PC 104 Acquisition System

Fully Enclosed in Box and inside the bias system enclosure
Client/Server Architecture in code (System is more modular)
Start with one ADC on system for tests.
Later add two ADCs so Voltage and Current can be captured simultaneously.

Get rid of back plane for 1x8 tests? — No / Yes

Modify Mux Schematics for 2 Outputs (Voltage and Current)

Analog Bias System
(Start Now – Can be ready for 1st row tests)

One card for one row of array. (24 total biases)
Each Bias circuit can be easily switched between all 3 bias functions. (SIS mixer, magnet, and LNA)
Use 256 Tap Digital Pot
Each card is independent (no back plane for the analog system.)
Multiplexing of signals on board. (2 signals leave board arranged so voltage and current can be measured at the same time.)
Full control of the bias system from external opto-isolated digital inputs.
Use Sierra Proto Express's 4 layer NOTouch PCB process for 3 boards for $153

Make 8 Analog boards that will fit in final design