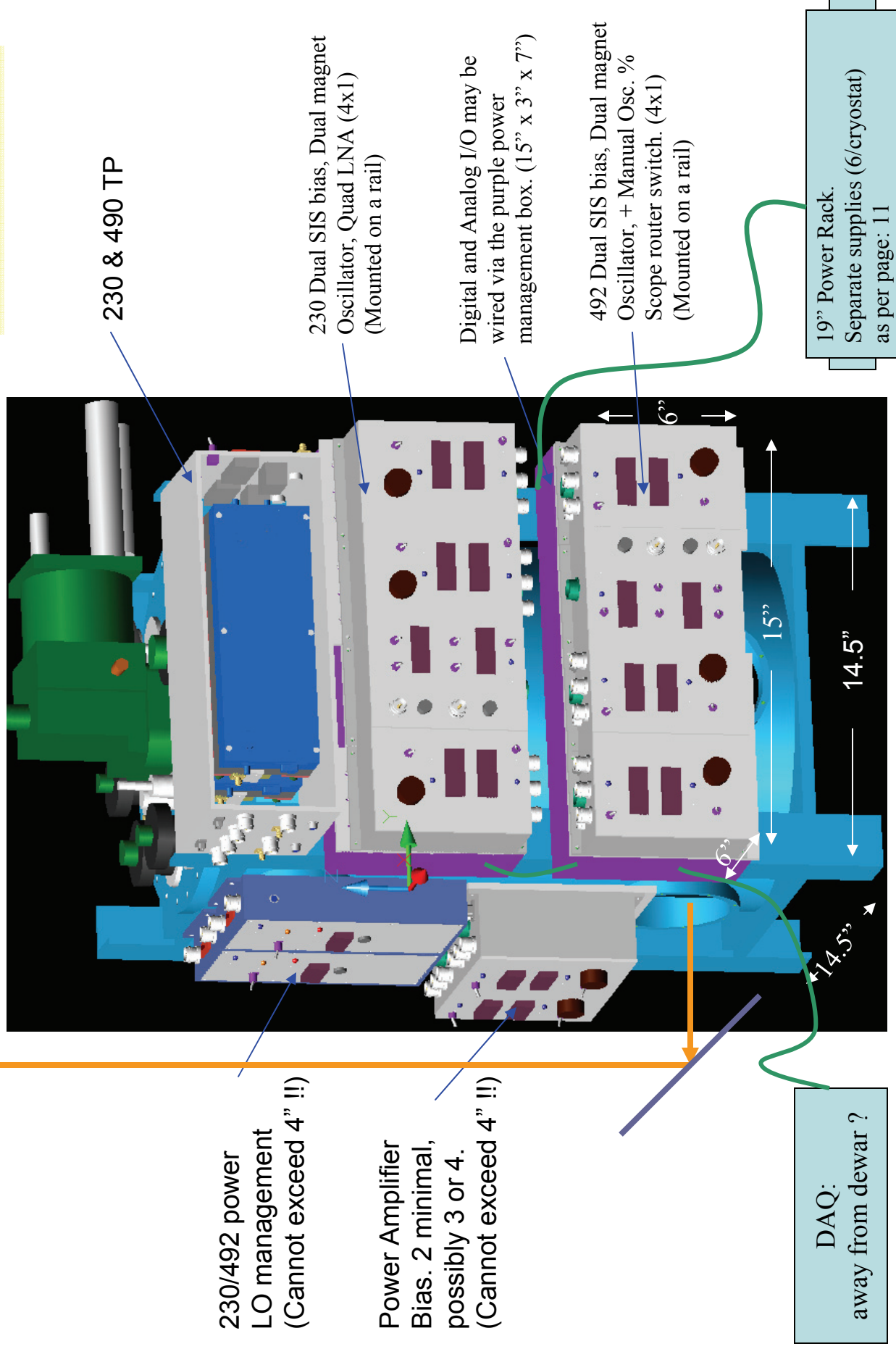


Beam to Sky

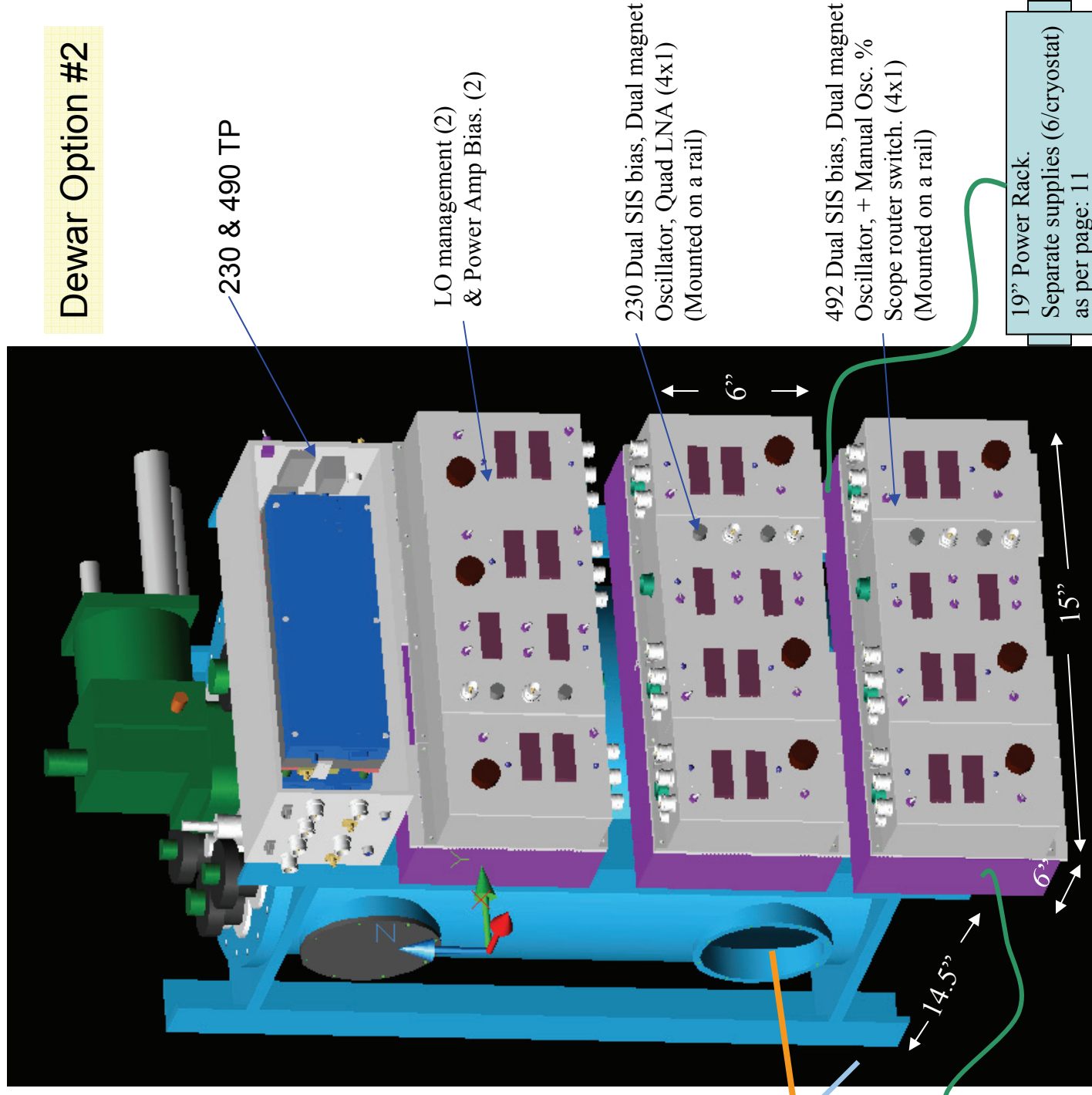
Progress status CSO Rx Upgrade

J. Kooi, 18 Dec, 2007.

Dewar Option #1



Dewar Option #2



230 & 490 TP

LO management (2)
& Power Amp Bias. (2)

230 Dual SIS bias, Dual magnet
Oscillator, Quad LNA (4x1)
(Mounted on a rail)

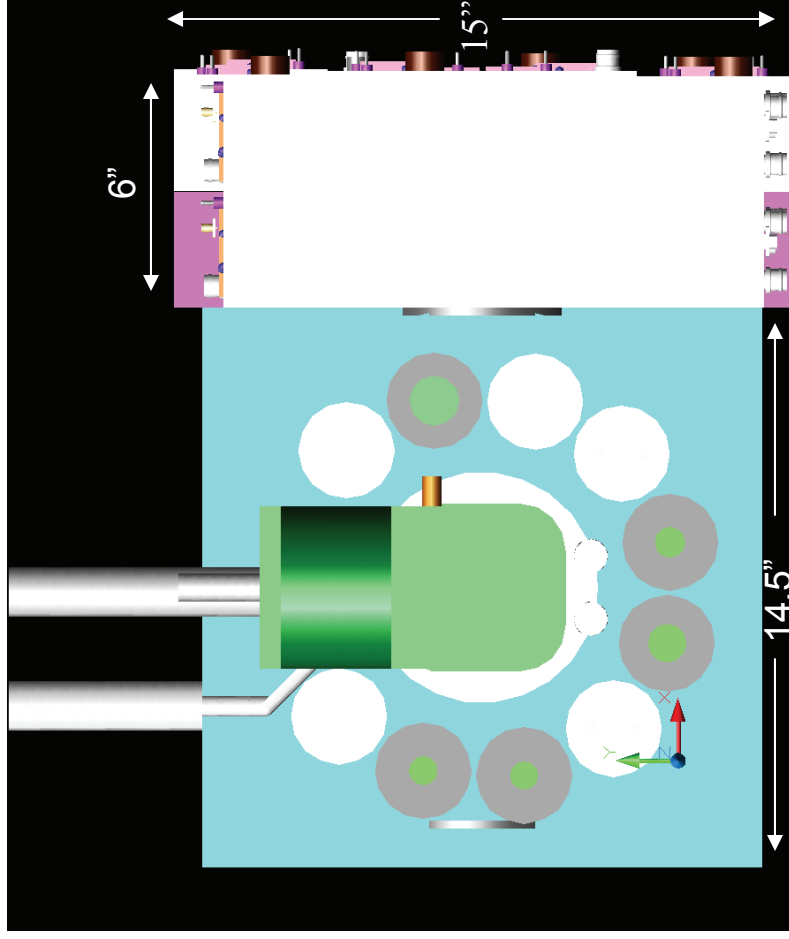
492 Dual SIS bias, Dual magnet
Oscillator, + Manual Osc. %
Scope router switch. (4x1)
(Mounted on a rail)

19" Power Rack.
Separate supplies (6/cryostat)
as per page: 11

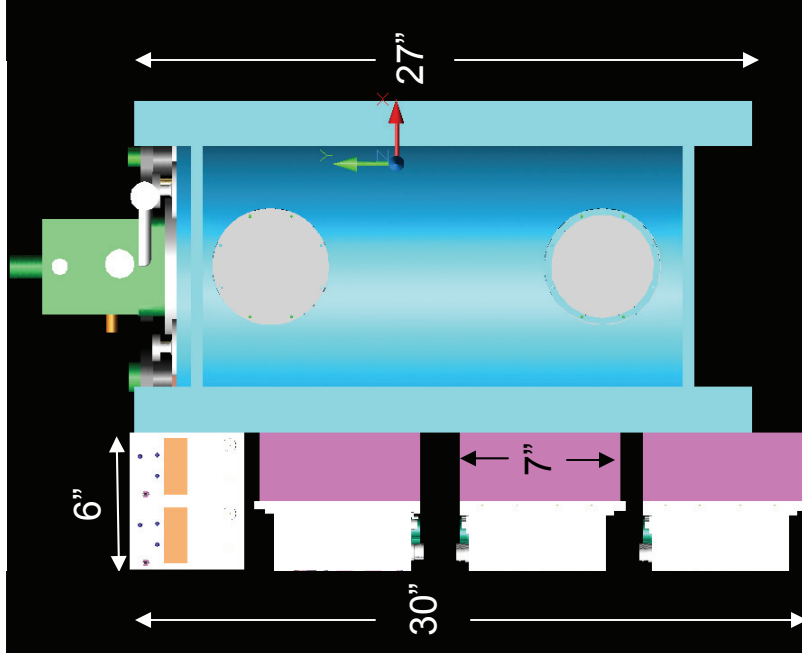
Digital and Analog I/O may be
wired via the purple power
management box. (15" x 3" x 7")

DAQ:
away from dewar ?

Dewar Option #2



Top-view

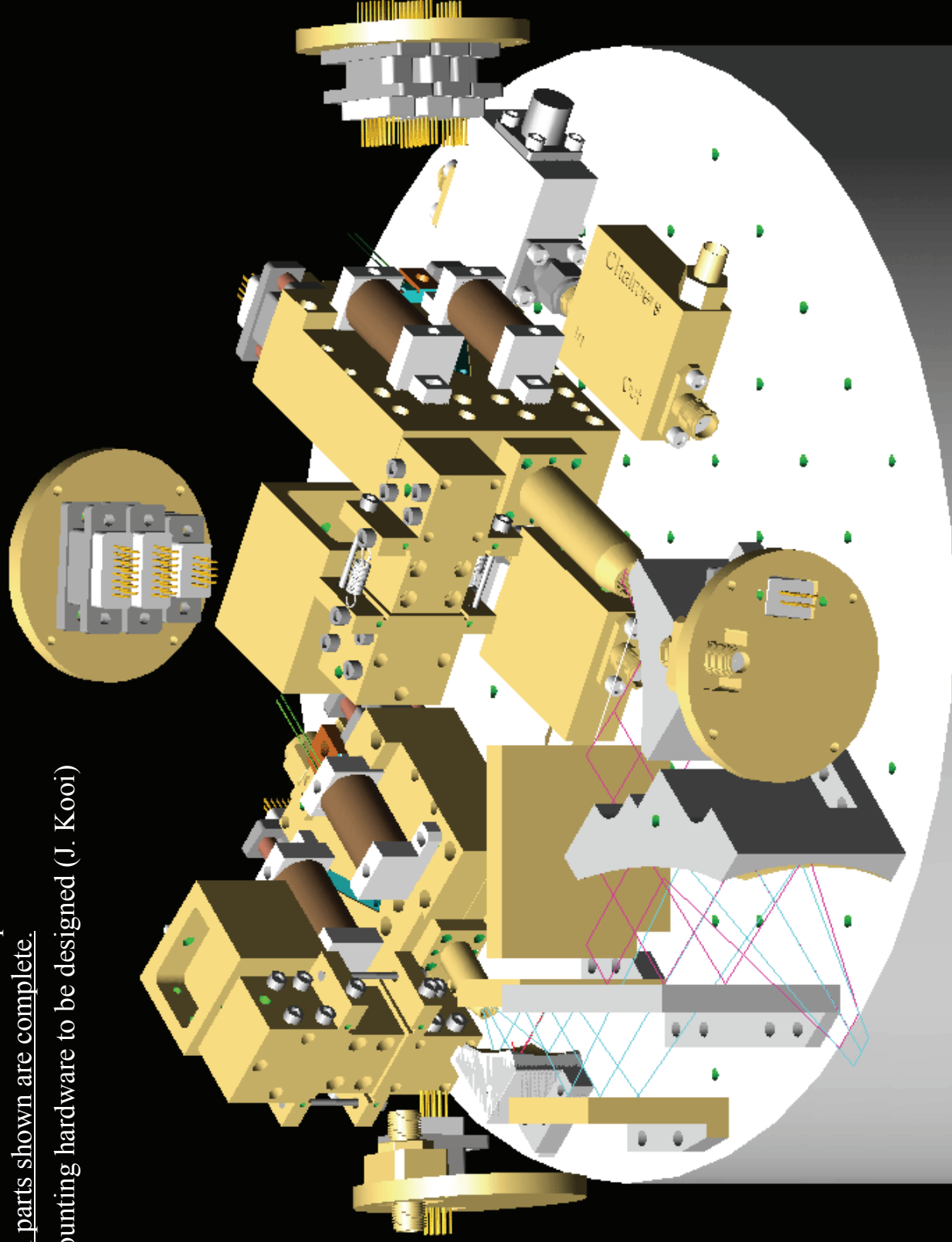


Bottom-view

230/492 Balanced Mixer setup.

All parts shown are complete.

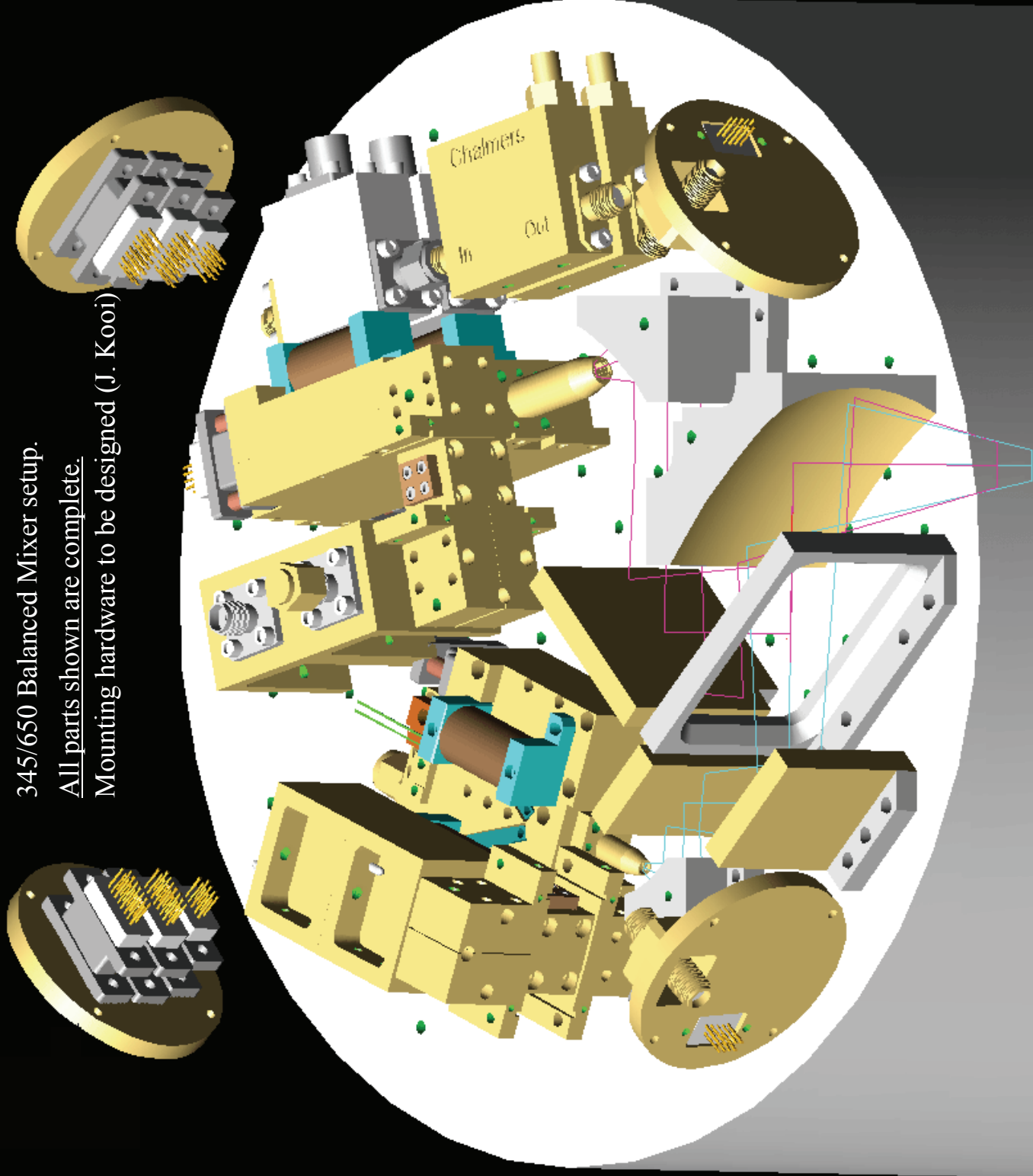
Mounting hardware to be designed (J. Kooi)



345/650 Balanced Mixer setup.

All parts shown are complete.

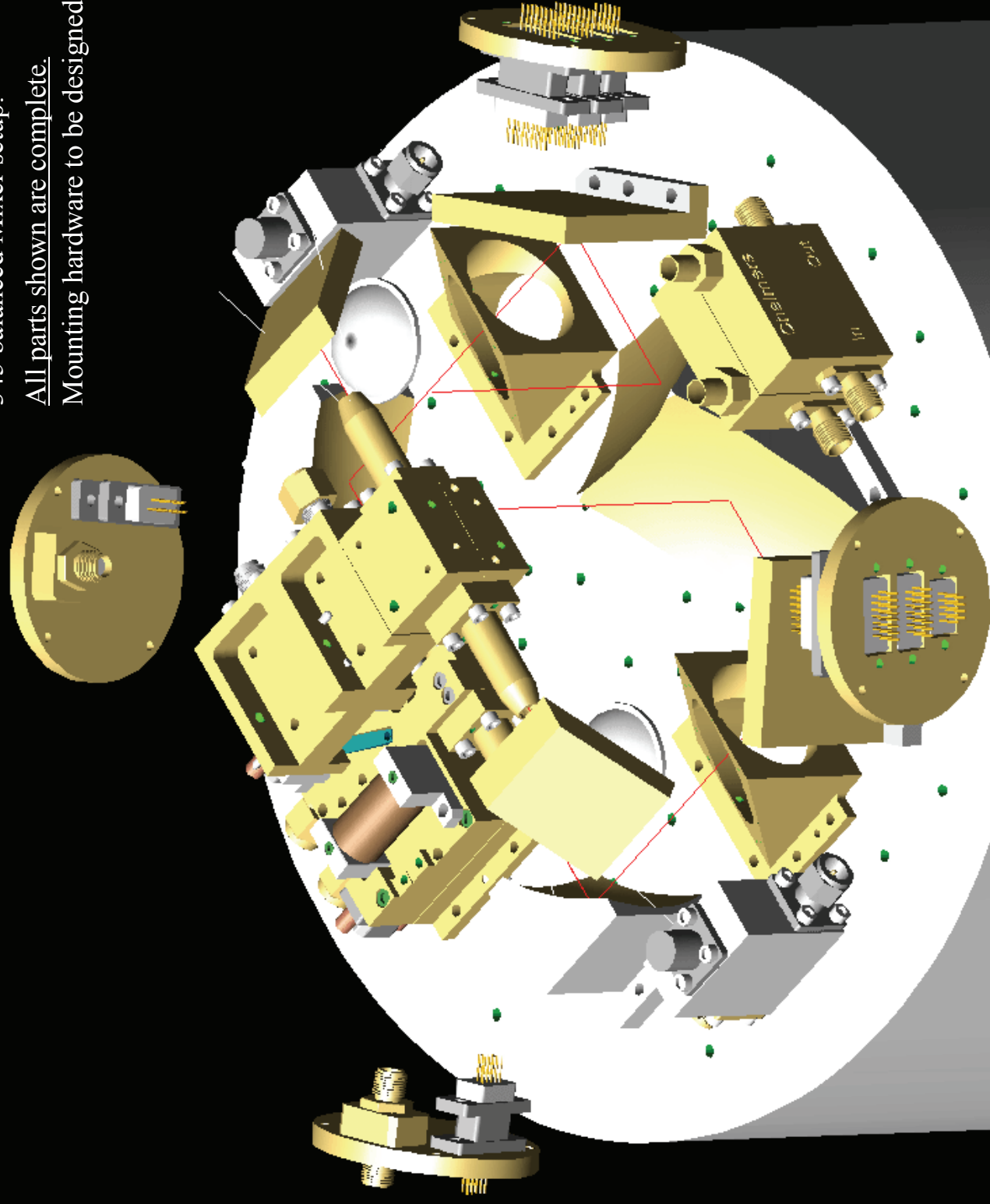
Mounting hardware to be designed (J. Kooi)



345 balanced Mixer setup.

All parts shown are complete.

Mounting hardware to be designed (J. Kooi)



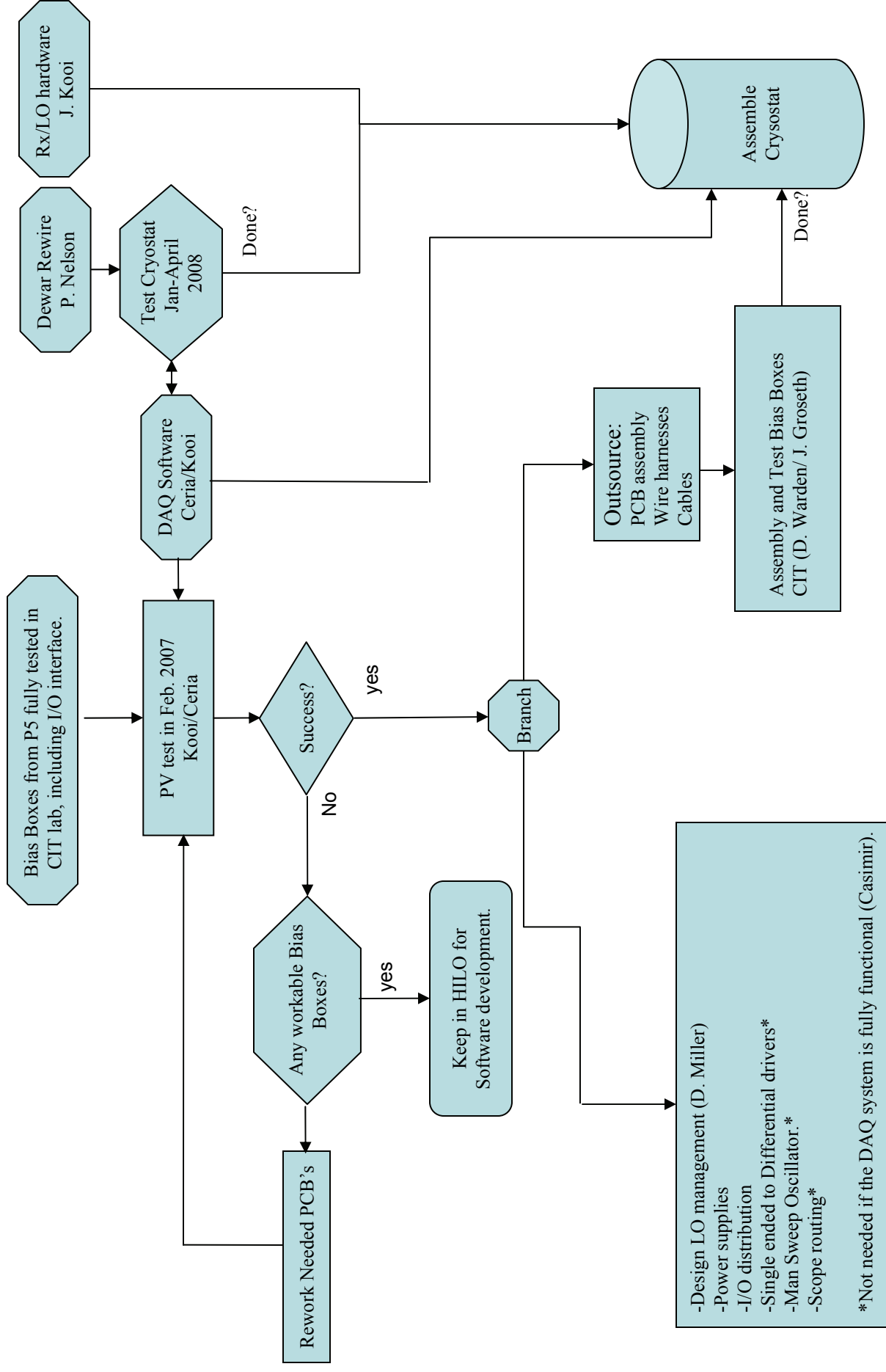
Performance Verification (PV) Test in Feb. 2008

Before assembling a full set of electronics hardware (~ 80 bias boxes for the CSO alone), it is essential that the performance of each bias box is verified. This is especially critical since all the PC boards are multi-layer with surface mount components, and no board service is possible. The technology development Receiver (Trex) will be ideal for this test. Upon successful complete of the PV stage it is recommended that manufacturing, and assembly of ALL bias boxes be outsourced. This is the only reasonable approach given the limited man power and time scale.

Barney (Trex) Upgrade / Performance Verification Test.																
Type	SIS	SIS	Preamps	Magnet	Total Power	JPL P.A.	LO Management	LNA	Power Boxes	Totals						
	Single	Dual	Dual	Dual				Quad	(+12`V, 5V)							
QTY Bias `Boxes`	1	0	1	1	1	1	1	1	0	6						
SIS Main PCB	1	0								1						
SIS I/O PCB	1	0								1						
SIS Preamp			2							2						
Mag Main PCB				1						1						
Mag I/O PCB				1						1						
T.P. PCB					1					1						
JPL P.A. PCB						1				1						
LO Management³							0			0						
LNA analog daughter PCB								4		4						
LNA I/O mother PCB³								1		1						

- Notes:
- The required bias boxes for this test are indicated in red.
 - Though very important in preventing multiplier damage, the LO management may be done at a later stage.

Flow Chart of required work.



First set (230/492 GHz) of Balanced Rx Electronics.

Sept. 2008. *

1 st Balanced Rx 5												
Type	SIS	SIS	Preamps	Magnet	Total Power	JPL P.A.	LO Management	LNA	Power Boxes	Totals		
	Single	Dual	Dual	Dual				Quad	(+/-12`V, 5V)			
QTY Bias `Boxes	0	2	2	2	2	2	1	1	3	15		
SIS Main PCB	0	4								4		
SIS I/O PCB	0	4								4		
SIS Preamp			4							4		
Mag Main PCB				2						2		
Mag I/O PCB				2						2		
T.P. PCB					2					2		
JPL P.A. PCB						2				2		
LO Management ³							1			1		
LNA analog daughter PCB								4		4		
LNA I/O mother PCB ³								1		1		

- The first half should be ideally be delivered around May 2008.

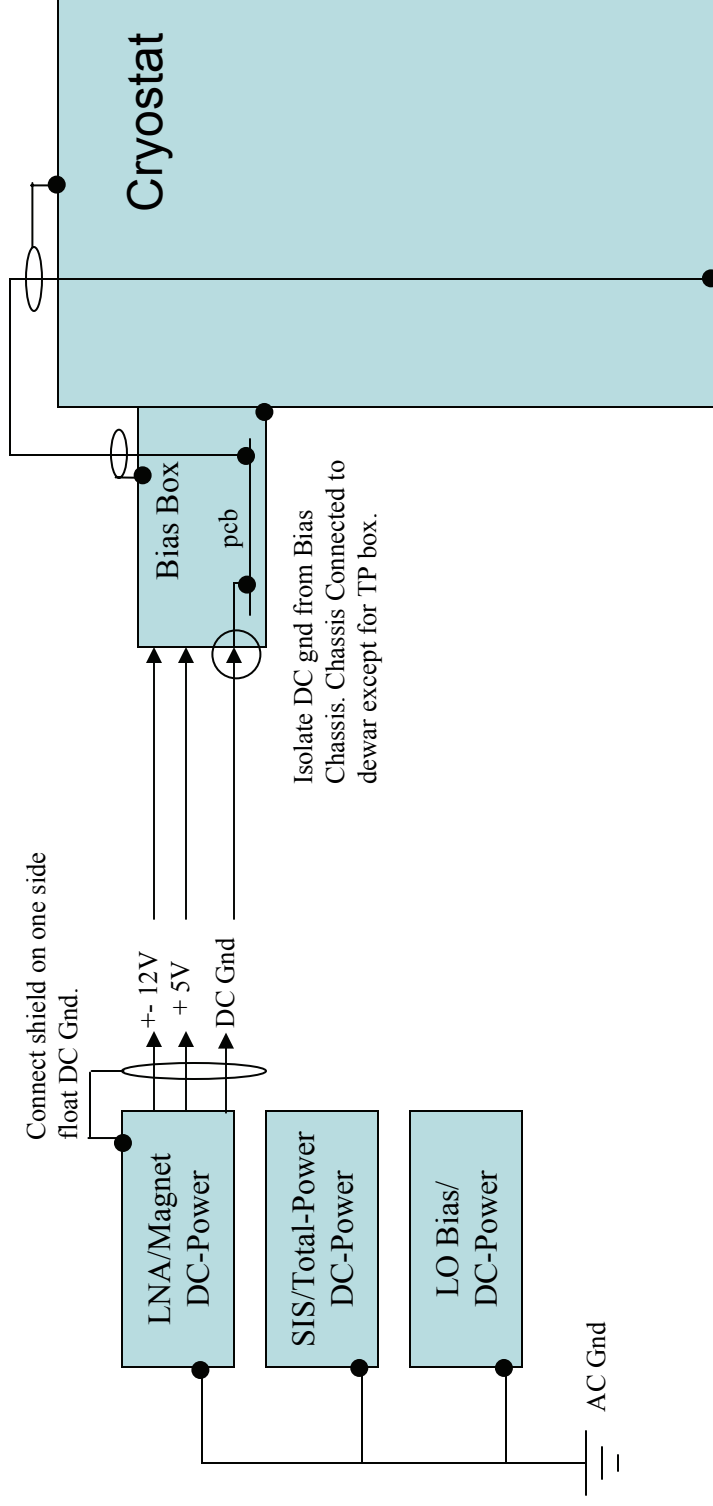
Total number of CSO Rx Electronics Bias boxes (Nov. 2008)

To keep the progress, All bias boxes including power supplies will need to be delivered by the end of 2008.

Summary Bias boxes needed for Rx upgrade.										
Type	SIS	SIS	Preamps	Magnet	Total Power	JPL P.A.	LO Management	LNA	Power Boxes	Totals
		Single	Dual	Dual				Quad	(+-12`V, 5V)	
QTY Bias `Boxes ^{1,2}		2	6	7	7	8	12	7	15	71
SIS Main PCB		2	12							14
SIS I/O PCB		2	12							14
SIS Preamp										14
Mag Main PCB				7						7
Mag I/O PCB				7						7
T.P. PCB					8					8
JPL P.A. PCB						12				12
LO Management ³							7			7
LNA analog daughter PCB								28		28
LNA I/O mother PCB								7		7

Ground and Power Supply layout (CSO Rx).

- All box chassis' s isolated from PCB circuit Gnd
- Opto-isolation on all digital I/O
- Total Power output needs a differential driver to separate from SIS ground. This is not an issue for DAQ only (remote) observations (Casimir).
- All bias boxes, except for T.P. can be tied to the dewar.
- Total power needs to float from dewar
- SIS/Total power can be shared
- LNA/Magnet power can be shared
- LO bias can be shared (common gnd).
- DC gnd from the bias boxes should be isolated from AC gnd.



Man Power Allocation and Time Schedule (CSO)

Jacob Kooi (CSO/Caltech): Hardware and LO Integration + various tests...

Pat Nelson (CSO): -230/492 cryostat rebuild March 2007.

- After completion his help will be needed with a few CSO particular test boxes that fall outside the list on page 7, 8. (Differential Drivers, Analog switches ..)

Riley Ceria (CSO): Ongoing data acquisition and software development support (labview).

Man Power Allocation and Time Schedule (Caltech)

Frank Rice: Electronics Design/Management

David Miller: Electronics Design

Doug Warden: Assembly

Jeff Groseth: Testing.

Post doc to assist with integration, beam alignment, calibration, focus curves etc.