



CLIO small task Digital system

2009/1/8(木) CLIO weekly meeting

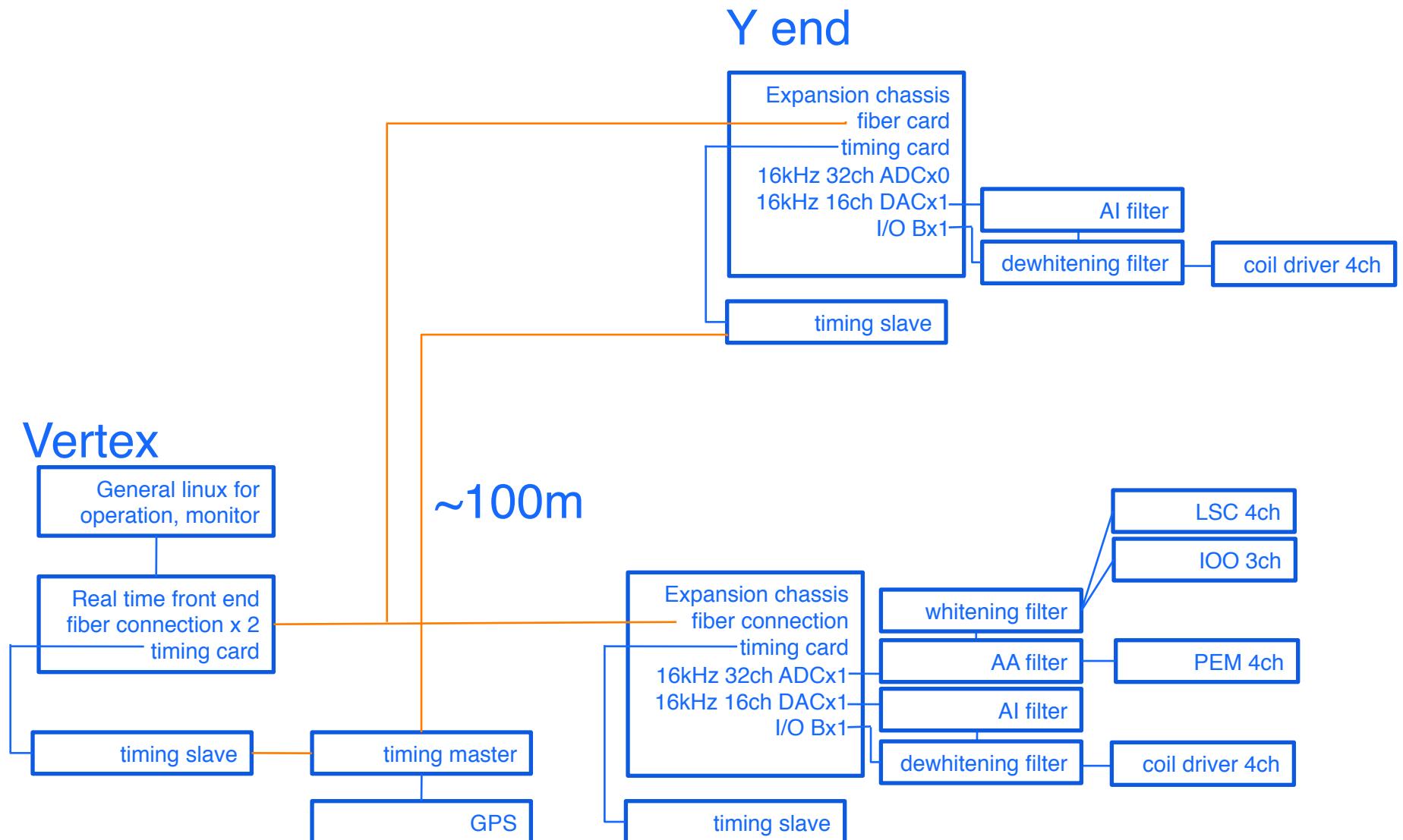
宮川 治

What CLIO needs

- 1 set of Advanced LIGO type new digital system
 - » SUN Fire X4600;4(or 8) processors, RAID HDD
 - » CentOS, Real Time Core, Matlab
 - » Expansion chassis
 - » ADC
 - » DAC
 - » I/O binary
 - » General linux for operation and monitor
 - » CDS software (RTFE, DAQS, LDAS?, NDS?, EPICS, AWG, DTT, foton, dataviewer, striptool, ezca, tds, burt, conlog)
- Related Analog circuits
 - » Timing system
 - » Whitening, dewhitening, anti aliasing, anti imaging filters

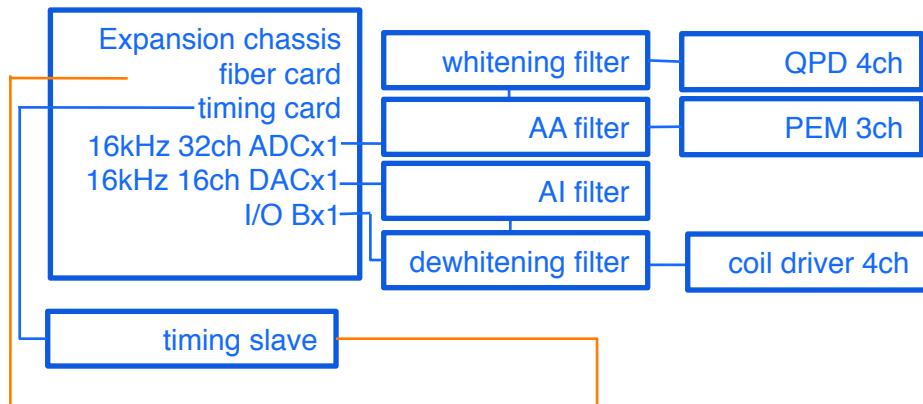
Technical documents:CDS wiki page at
<http://ilog.ligo-wa.caltech.edu:7285/advligo/CdsDesignDocuments>

CLIO digital block diagram: 1st stage



CLIO digital block diagram: Locked-FP

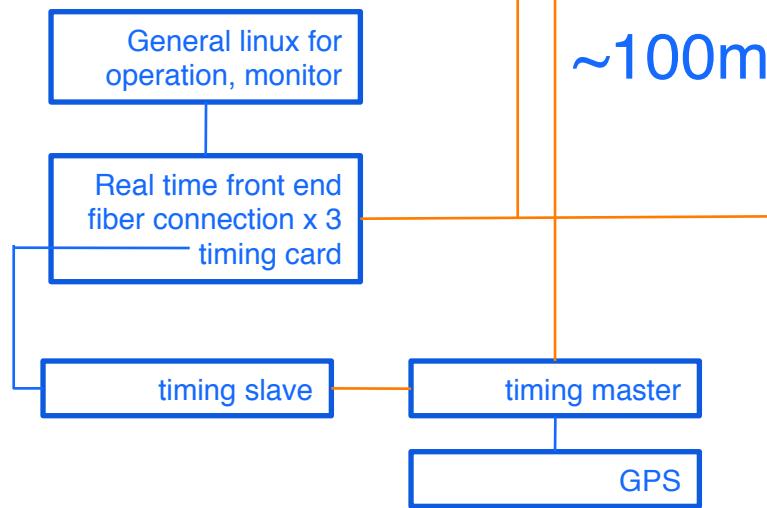
X end



Y end



Vertex



~100m

Channel list for CLIO digital: 1st trial

- ADC 16kHz
 - » MC REFL: (DC) = 1ch
 - » MC Trans: 1ch
 - » MC_F :1ch
 - » LSC: (DC, RF) x2 = 4ch
 - Total 7ch
- ADC 2kHz
 - Total 0ch
- ADC 256Hz
 - » Laser power 1
 - » Seismic 1
 - » Acoustic 1
 - » Temperature 1ch
 - Total 4ch
- DAC
 - » MC: 1 SUS x 4 coils = 4ch
 - » IFO: 1 SUS x 4 coils = 4ch
 - Total 8ch
 - (Vertex 4ch, X end 0ch, Y end 4ch)
- Binary I/O
 - » 2SUS x 4coils = 8ch
 - » MC fast gain, swirch, boost, test
 - » Y arm gain, swirch, boost, test

Channel list for CLIO locked-FP

- ADC 16kHz
 - » MC REFL: (DC, RF) = 2ch
 - » MC Trans: 1ch
 - » MC_F :1ch
 - » LSC: (I&Q,DC) x2 = 6ch
 - » Trans QPD: 4quad x2 = 8ch
 - Total 18ch
- (Vertex 10ch, X end 4ch, Y end 4ch)

- ADC 2kHz
 - » MC WFS(I&Q,DC)12ch x2 = 24ch
 - » IFO WFS(I&Q,DC)12ch x4 = 48ch
 - Total 72ch
- (Vertex 72ch, X end 0ch, Y end 0ch)

- ADC 256Hz
 - » Laser power, temp, current 3
 - » Seismic 3
 - » Acoustic 3
 - » Temperature 3ch
 - » Humidity 1ch
 - » Particle 1ch
 - Total 14ch
- (Vertex 8ch, X end 3ch, Y end 3ch)

- DAC
 - » Laser thermal 1ch
 - » Laser steering: 4ch
 - » MC: 3 SUS x 4 coils = 12ch
 - » IFO: 5 SUS x 4 coils = 20ch
 - total 45ch
- (Vertex 37ch, X end 4ch, Y end 4ch)

- Binary I/O
 - » 8SUS x 4coils = 32ch
 - » MC fast gain, swirch, boost, test
 - » Yarm gain, swirch, boost, test



Schedule update

- 今年度中にLIGOに支払う予定
- 宮川/和泉が2月中旬にCaltech行き
- それまではCLIOのロック自動化

CLIO digital system installation schedule



短期タスク

- 予算のLIGOへのTransfer
- 部品の発注
- MC回路と、In-arm回路の改良
 - TTLによる切り替え
 - スイッチ類(signal, boost on/off, 三代木さんが既に着手)
 - Gain調整
 - できれば、offset調整、TEST信号インプット on/off

CLIO digital parts list

6-Jan-2009

group	Ref	Qty 1st	Qty2nd	final Qt	Part Number	Description	Vendor	Price	1st stage cost	2nd stage cost	total cost	Comment
1	1	1	0	1	Fire X4600 ?processors	Work station	SUN	11000	11000	0	11000	
1	2	2	1	3	D050567-A	Expansion chassis	LIGO	1000	2000	1000	3000	Cost?
1	3	2	1	3	? PCI/PCI-X backplane 64/66MHz EXPANSION BACKPLANE	MOBILITY ELECTRONICS, INC.	1000	2000	1000	3000	Cost?	
1	4	2	1	3	? PCI EXPRESS TO PCIX EIF PHOENIX MEZZ BOARD	MAGMA	2000	4000	2000	6000	Cost?	
1	5	2	2	4	150m Fiber optical patch cable LC-LC Duplex MM	CDW	200	400	400	800		
1	6	2	0	2	10m Fiber optical patch cable LC-LC Duplex MM	CDW	100	200	0	200		
1	7	1	4	5	PMC66-16AI64SSA-64-50M	ADC Modules and cables	General Standards	4000	4000	16000	20000	
1	8	2	3	5	PMC66-16AO16-16-F0-DF	DAC Modules and cables	General Standards	4000	8000	12000	20000	
1	9	2	2	4	PCI-IIRO-16	Binary I/O Modules and cables	CHASSIS PLANS	400	800	800	1600	
1	10	5	9	14	? Connection card among timing ADC or DAC to AA or AI	LIGO	100	500	900	1400	Cost?	
1	11	1	0	1	Tempus LX	GPS Network Time Server	EndRun TECHNOLOGIES	1000	1000	0	1000	Cost?
1	12	1	0	1	D050239	Master Timer Sequencer	LIGO		0	0	0	Might be made in Japan, cost?
1	13	2	1	3	D050442	Timing slave	LIGO		0	0	0	Might be made in Japan, cost?
1	14	1	4	5	? Whitening filter	LIGO		0	0	0	0	Might be made in Japan, cost?
1	15	2	3	5	? De-whitening filter	LIGO		0	0	0	0	Might be made in Japan, cost?
1	16	1	4	5	D070081	AdL AA filter	LIGO		0	0	0	Might be made in Japan, cost?
1	17	2	3	5	D070081	AdL AI filter	LIGO		0	0	0	Might be made in Japan, cost?
									0	0	0	
2	18	1	0	1	Matlab, simulink			2000	2000	0	2000	
2	19	1	0	1	Real time linux core	Windrevier	2000	2000	0	2000		
									37900	34100	72000	