Run 2B Silicon Electronics Workshop

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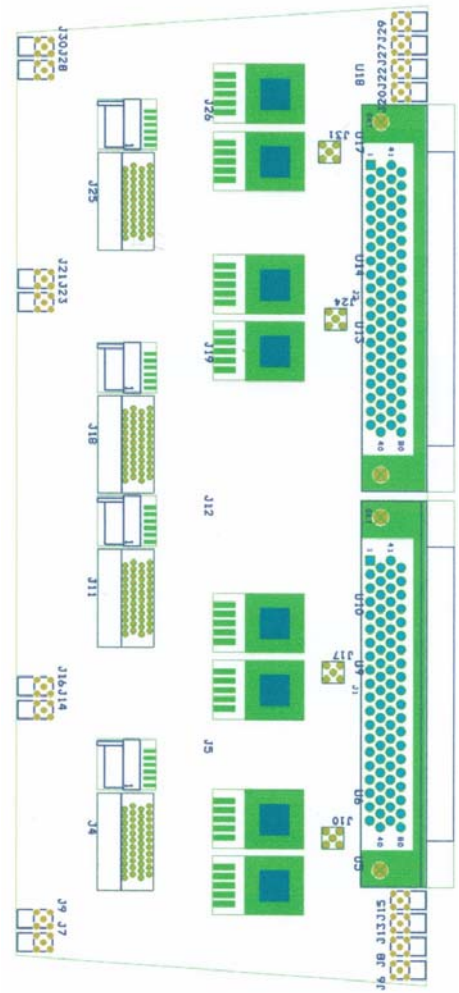
Agenda : April 22nd 2002

1. Adapter Card and Purple (test) Card reviews
2. Low Voltage supplies for Run2B
3. Horse-shoe and Cathedral arrangements for Run2B
4. Grounding issues in silicon

Adapter Card

Hybrid - Jumper Cable - Junction Card - Twisted Pair Cable – **Adapter Card**

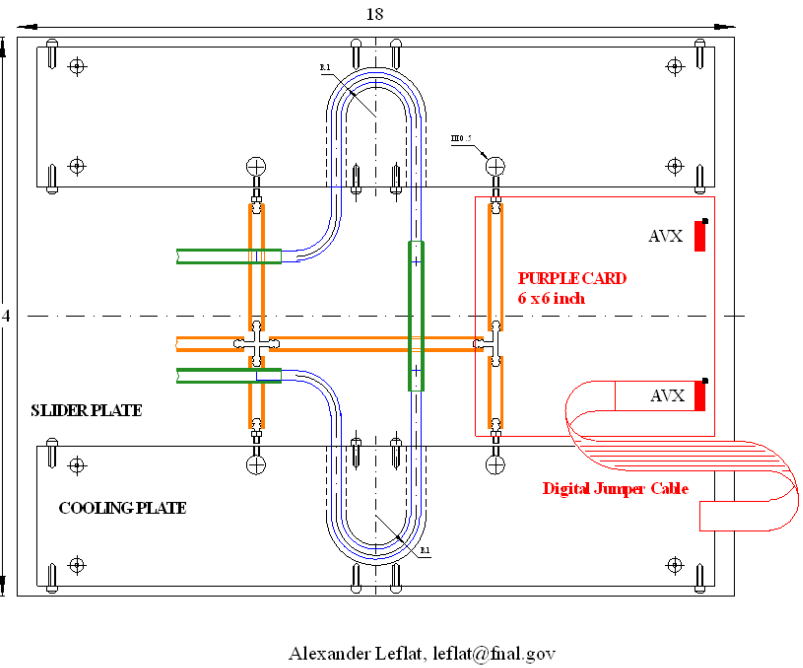


Top view of 4-channel Adapter Card

- Adapter Card is active :
  - Two voltage regulators per hybrid: analog and digital voltages
  - Differential-to-Single-Ended 2.5-to-5 V translation for SVX4 Data
  - 5-to-2.5 V translation for SVX4 Controls
  - Clock refreshing and HV routing
- Reviewed schematics and conceptual layout
  - Mostly ok
  - Need stronger drivers for signals going to IB, redesign necessary
  - Power dissipation is large ~500W /side, will increase after the above change
  - Heat can be sunk to Horseshoe and water cooled, cooling need calculations and design
- Two weeks needed for changes
  - Prototypes can be ready in July

Purple Card

Hybrid – **Purple Card** - Sequencer



Top view of burn-in stand with Purple Card

- Purple Card replaces IB and AC
  - Used for production burn-in and all possible testing and debugging
- Reviewed schematics and conceptual layout
  - Need more length (7.3” => 9”)
  - Otherwise had only minor comments: extra header, AVDD-DVDD jumper, isolated SHV
- On track with schedule
  - Prototypes can be ready in June

Horse Shoe in Run 2B

- Two options
  - A: 4-channel Adapter Card
    - Single card
    - For L0-1 : 4 Junction Cards map to 3 AC
  - B: 4- & 6-channel Adapter Cards
    - Two flavors of
    - Straightforward mapping for L0-1
  - Other stuff at the Horse shoe
    - Cards for radiation monitors
    - Cards for 4-point temperature monitors (?)
- Assumption : do not recable 80-conductor cables
  - Need verify mapping, constraints :
    1. From inside to AC
    2. From IB to AC
    3. STT needs

Low Voltage supplies

- Power dissipation

Hybrid	No.	Avdd/ chip	DVDD/ chip	Power @ 2.75V	P/chip	P,total	I,total
2 chip	144	.120 A	.220 A	0.94 W	.47 W	135 W	49 A
6 chip	72	.360	.340	1.93	.32	139	51
10 chip	672	.600	.460	2.92	.29	1962	714
Totals	888					**2237**	**813A**
					Per crate	**280W**	**102A**

  - Dissipate outside (Horseshoe) 500-1000 W per side
  - Need separate 3.3 V (and 5 V) supplies

LV Power, Run 2b (recycle Megapacs)

Slot	Name	V_typ	I_max	Power Rating	I_used	Power Used
1	Vcc1	6.3	30.8	194	24	151
2	Vcc2	6.3	30.8	194	21	132
3	Vcc3	6.3	30.8	194	17	107
4	Spare			110		
5	SVX4(1)	3.5	32	110	21	66%
6	SVX4(2)	3.5	32	110	21	66%
7	SVX4(3)	3.5	32	110	21	66%
8	SVX4(4)	3.5	32	110	21	66%
9	SVX4(5)	3.5	32	110	21	66%
10	+15V	15.5	6.5	100	4.4	68
				1342w		830w

IB

Grounding

- Run 2B will have the same grounding scheme as Run 2A (because we do not change IBs)
  - All grounds (AVDD, DVDD, VCC, HV) are tied together in IBs
  - The grounds are kept together all the way from IB to HDI
    - Horseshoe is not connected to Central Calorimeter
    - Horseshoe has common ground for all ACs
- CDF has different grounding scheme
  - AVDD and DVDD grounds are tied together on the hybrid
  - They are kept separated all way to the power supplies
  - CDF is more sensitive due to deadtimeless operation