FE Board Type Summary

Option 1

Two FE boards

CFT FE Board	**8 MCM**	
CFT/CPS Axial		480 CFT to single channels, 32 CPS to 64 after split
CFT stereo		480 to single channels, 32 into split-modified-to-single channels
FPS Front Layers		404 Front strips into CFT channels, 16 Back strips into CPS splits
PS FE Board	**16 MCM**	
FPS Back layers		128U and 128V from wedge 1, same from wedge 2 into 512 to 1024 board
CPS Stereo		128U and 128V from North, same from South into 512 to 1024 board

Option 2

Two FE boards

CFT FE Board	**8 MCM**	
CFT/CPS Axial		480 CFT to single channels, 32 CPS to 64 after split
CFT stereo		480 to single channels, 32 into split-modified-to-single channels
FPS FE Board MOD **I**	**12 MCM**	
FPS One Wedge		136U and 136V from wedge into split, 104U and 104V into single/split-mod-to-single
CPS Stereo		128x and 128x into charge split, 64x and 64x into single/split-modified-to-split channels
FPS FE Board MOD II	***16 MCM***	
FPS One Wedge		*136U and 136V from wedge into split, 104U and 104V into split*
CPS Stereo		*128U and 128V North into charge split, 128U and 128V South into split*

Option 3

One FE board

CFT FE Board	**8 MCM**	
CFT/CPS Axial		480 CFT to single channels, 32 CPS to 64 after split
CFT stereo		480 to single channels, 32 into split-modified-to-single channels
FPS One Wedge		136U and 136V from wedge into single channels, 104U and 104V into singlechannels
CPS Stereo		128U and 128V South into single, 128U and 128V North into single channels

NOTE:

for the FPS the 101 forward strips are counted as 104
the 135 back strips are counted as 136

Figure A1

FE Board Type Attributes

Option 1

Two FE boards		
CFT FE Board	**8 MCM**	
CFT/CPS Axial		Requires that FPS forward layers be put into 8 cassettes
CFT stereo		and FPS back layers be put into 8 different cassttes
FPS Front Layers		Requires that the PS boards have 8 MCMs on the back side
PS FE Board	**16 MCM**	as well as 8 MCMs on the front side
FPS Back layers		This means 13 cassettes holding 16+10 FE boards are about
CPS Stereo		1" wider
		13"/2 longer cryostats

Option 2

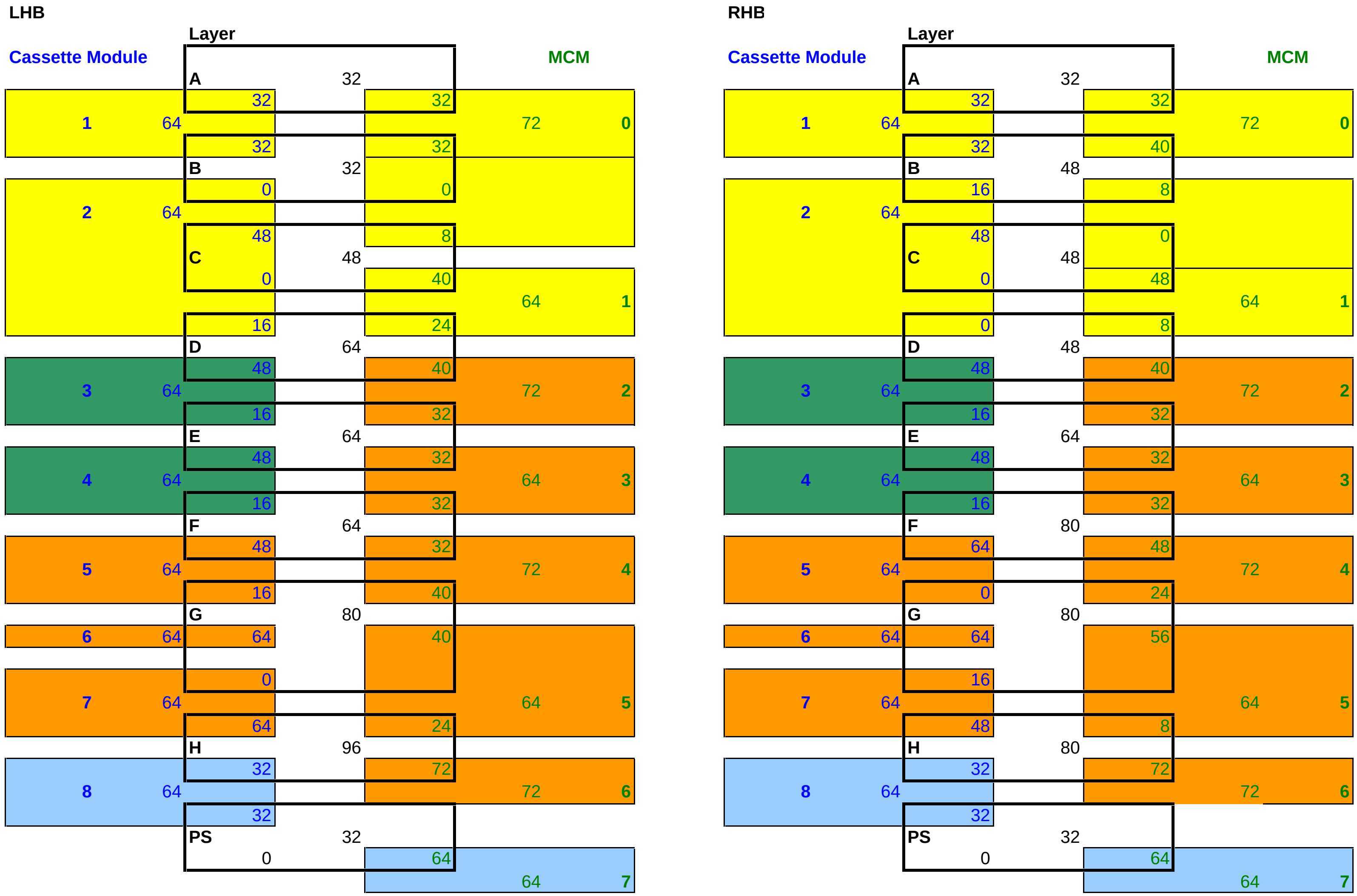
Two FE boards		
CFT FE Board	**8 MCM**	
CFT/CPS Axial		
CFT stereo		
FPS FE Board MOD **I**	**12 MCM**	Requires MCMs on back side also. (see above)
FPS One Wedge		Now require a total of 24 wider cassettes for 32+16 FE Boards
CPS Stereo		24"/2 longer cryostats
FPS FE Board MOD II	***16 MCM***	**Allows for charge split for FPS Forward layers**
FPS One Wedge		*Requires 8 MCMs on the back side.*
CPS Stereo		*Now requires 21 wide cassettes for 32+10 FE Boards*
		21"/2 wider cryostats

Option 3

One FE board		
CFT FE Board	**8 MCM**	This board looks like the CFT FE board of option 1
CFT/CPS Axial		**NO* channels have charge split nor 11bits of ADC**
CFT stereo		* CPS Axial has charge split (or could have NO charge split at all)
FPS One Wedge		No change to cyrostats
CPS Stereo		

Figure A2

CFT-CPS Axial Cstte



The number of channels from layers B, D, F and H is exchanged between the LH and RH boards on a cassette
to make the smalles cassette connector 16 channels.
The bias splits at the D layer on the LHB and at the B layer on the RHB. The thresholds for both split in the D layer.

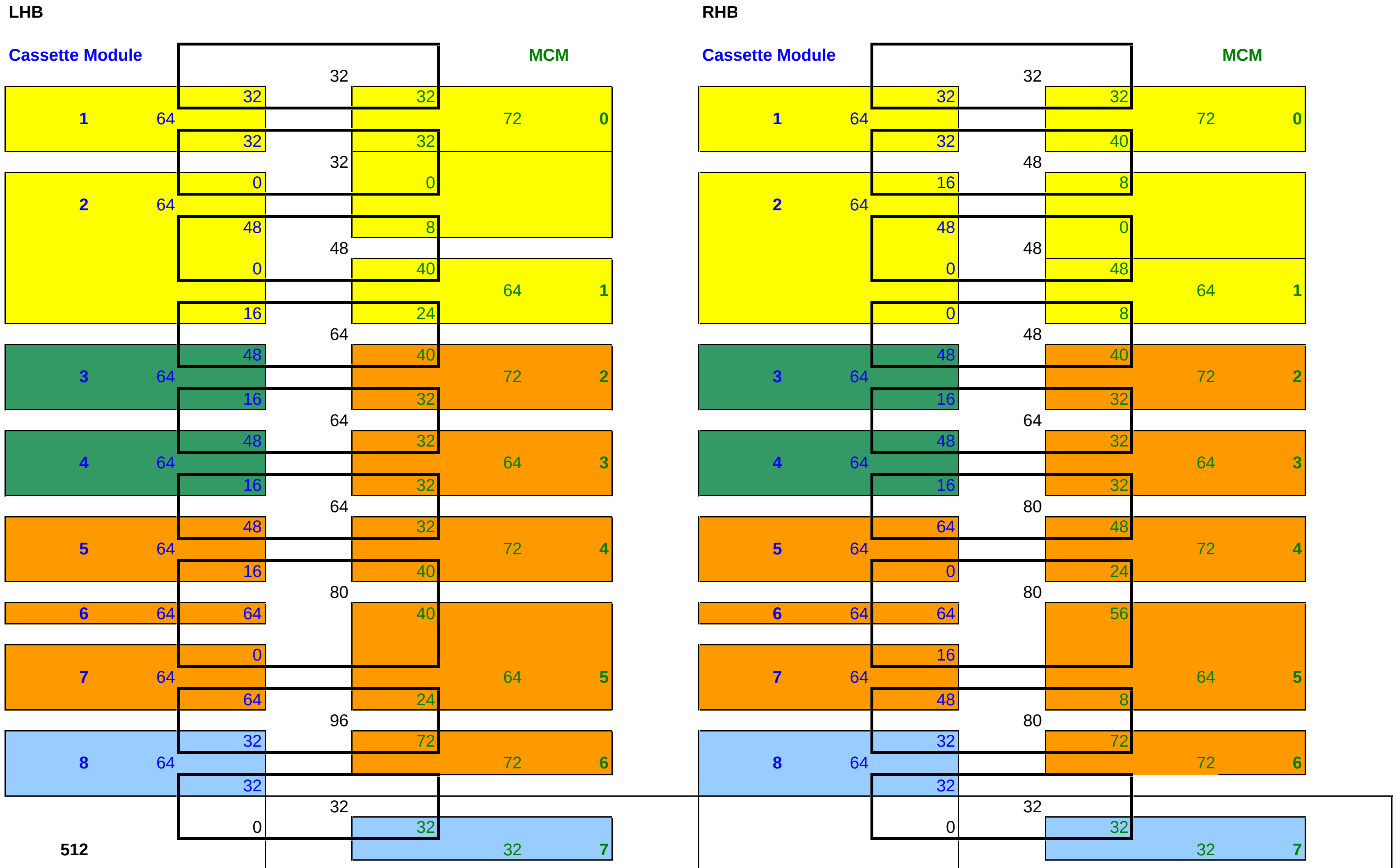
Figure A3

Chip ID	Type	# of Channels	Readout Time	Occ. 3%	Contents
0	SVX	72	2.96	0.1664	ADC values for fibers
1	SVX	64	2.64	0.1568	
2	SVX	72	2.96	0.1664	
3	SVX	64	2.64	0.1568	
4	SVX	72	2.96	0.1664	
5	SVX	64	2.64	0.1568	
6	SVX	72	2.96	0.1664	
7	SVX	64	2.64	0.1568	ADC values for CPS Axial Stips
8	VSVX	60	2.48	1.232	Discriminator Outputs for 480 fibers
		12	0.56	0.56	Track counts sent to L1
		48	2	1.0016	Track lists sent to L2
		8	0.4	0.4	FE board monitoring data
9	VSVX	8	0.4	0.4	Discriminator Outputs for 64 PS strips
		8	0.4	0.4	Cluster lists sent to L2
Total		688	32.44	9.0864	

NOTE: The Readout Time column already assums zero-suppress mode because it shows the readout time for the bonded channels only. In non-zero-suppress mode each SVX has 128 channels and takes 5.12 usec

NOTE: The Occ column uses the fraction occupancy shown in the 2nd row for the channels. For the VSVX this occupancy value is multiplied by 16 as a guess at the relative length of these for any given occupancy value.

Figure A4



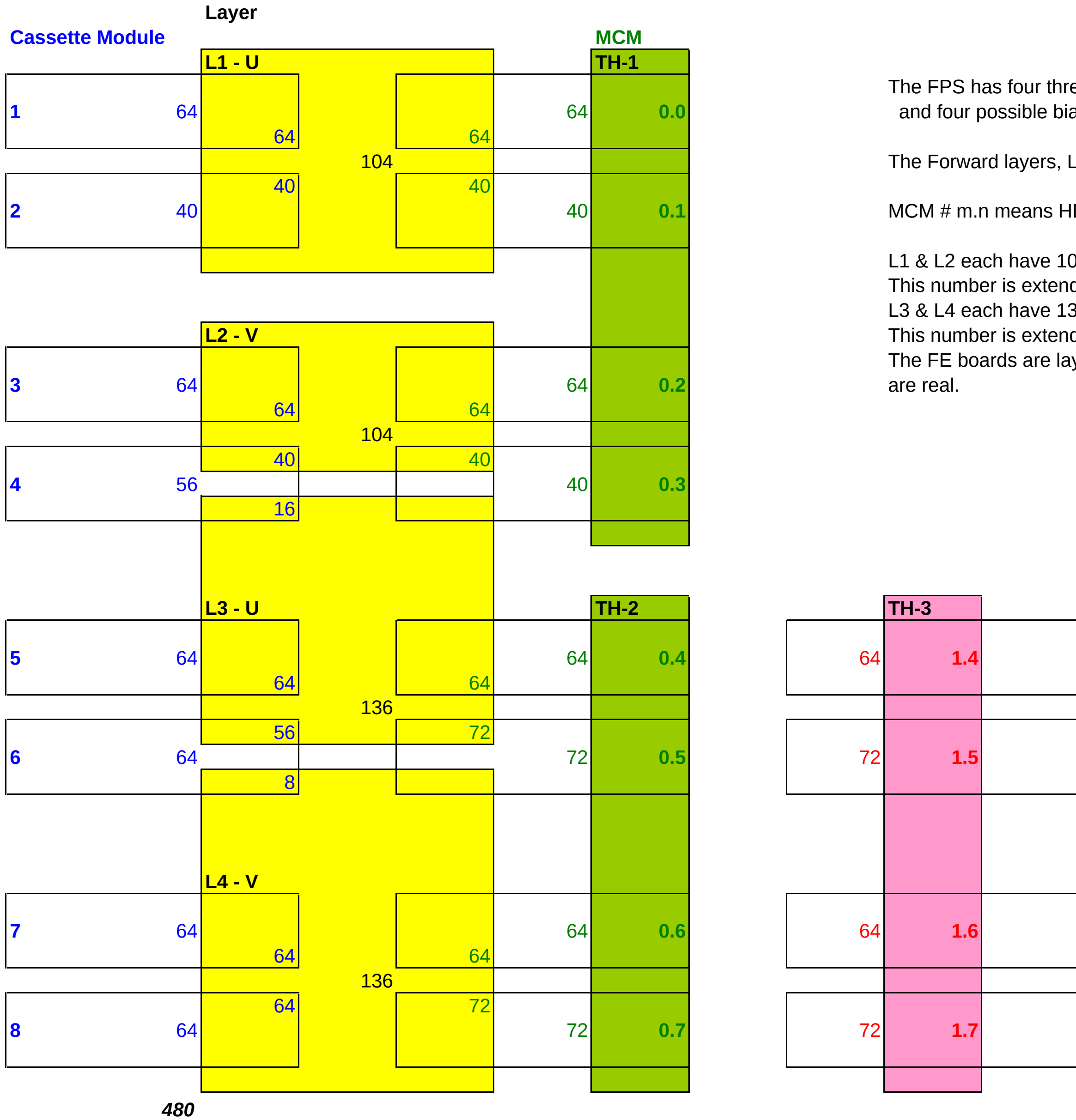
The CFT Stereo Channels use the same 'bare' FE board as the CFT Axial
In this case 512 channels from the same layer are input. 128 U channels and 128 V channels.
The FE board is stuffed differently. The charge splitting networks are removed.

Chip ID	Type	# of Channels	Readout Time	Occc. 3%	Contents
0	SVX	72	2.96	0.17	ADC values from two ribbons
1	SVX	64	2.64	0.16	
2	SVX	72	2.96	0.17	
3	SVX	64	2.64	0.16	
4	SVX	72	2.96	0.17	
5	SVX	64	2.64	0.16	
6	SVX	72	2.96	0.17	
7	SVX	32	1.36	0.12	
8	VSVX	64	2.64	1.31	Discriminator Outputs for 512 fibers
Total		576	27.56	6.36	

NOTE: The Readout Time column already assums zero-suppress mode because it shows the readout time for the bonded channels only. In non-zero-suppress mode each SVX has 128 channels and takes 5.12 usec

NOTE: The Occ column uses the fraction occupancy shown in the 2nd row for the channels. For the VSVX this occupancy value is multiplied by 16 as a guess at the relative length of these for any given occupancy value.

Figure A6



The FPS has four thresholds
and four possible bias values

The Forward layers, L1 and L2 have NO charge splitting.

MCM # m.n means HDI # m and MCM/SVX # n

L1 & L2 each have 101 strips.
This number is extended to 104 by adding 3 phatom strips
L3 & L4 each have 135 strips.
This number is extended to 135 by adding 3 phatom strips
The FE boards are layed out as if these phatom strips
are real.

Figure A7

HDI ID	Chip ID	Type	# of Channels	Readout Time	Occ. 3%	Contents
2n	0	SVX	64	2.64	0.16	ADC values for forward strips - no charge division
	1	SVX	40	1.68	0.13	
	2	SVX	64	2.64	0.16	
	3	SVX	40	1.68	0.13	
	4	SVX	64	2.64	0.16	ADC values for backward strips - high gain
	5	SVX	72	2.96	0.17	
	6	SVX	64	2.64	0.16	
	7	SVX	72	2.96	0.17	
	Total		480	23.64	5.02	
2n+1	4	SVX	64	2.64	0.16	ADC values for backward strips - low gain
	5	SVX	72	2.96	0.17	
	6	SVX	64	2.64	0.16	
	7	SVX	72	2.96	0.17	
	8	VSVX	13	0.60	0.33	Discriminator Outputs for u forward (101 strips)
		VSVX	13	0.60	0.33	Discriminator Outputs for v forward (101 strips)
		VSVX	17	0.76	0.41	Discriminator Outputs for v back - high gain (135 strips)
		VSVX	17	0.76	0.41	Discriminator Outputs for u back - high gain (135 strips)
		VSVX	17	0.76	0.41	Discriminator Outputs for v back - low gain (135 strips)
		VSVX	17	0.76	0.41	Discriminator Outputs for u back - low gain (135 strips)
		VSVX	8	0.40	0.40	FE Board Monitoring data
	9	VSVX	8	0.40	0.23	Discriminator Outputs for 64 PS strips
		VSVX	8	0.40	0.23	Cluster lists sent to L2
	Total		390	20.44	7.60	

NOTE: The Readout Time column already assums zero-suppress mode because it shows the readout time for the bonded channels only. In non-zero-suppress mode each SVX has 128 channels and takes 5.12 usec

NOTE: The Occ column uses the fraction occupancy shown in the 2nd row for the channels. For the VSVX this occupancy value is multiplied by 16 as a guess at the relative length of these for any given occupancy value.

The CPS Stereo has four thresholds and four possible bias values.

MCM # m.n means HDI # m and MCM/SVX # n

Figure A9

CPS Stereo SVX

HDI ID	Chip ID	Type	# of Channels	Readout Time	Occ. 3%	Contents
2n	0	SVX	64	2.64	0.16	ADC values for u layer - low gain
	1	SVX	64	2.64	0.16	
	2	SVX	64	2.64	0.16	
	3	SVX	64	2.64	0.16	
	4	SVX	64	2.64	0.16	ADC values for u layer - high gain
	5	SVX	64	2.64	0.16	
	6	SVX	64	2.64	0.16	
	7	SVX	64	2.64	0.16	
	Total		512	24.92	5.05	
2n+1	0	SVX	64	2.64	0.16	ADC values for v layer - low gain
	1	SVX	64	2.64	0.16	
	2	SVX	64	2.64	0.16	
	3	SVX	64	2.64	0.16	
	4	SVX	64	2.64	0.16	ADC values for v layer - high gain
	5	SVX	64	2.64	0.16	
	6	SVX	64	2.64	0.16	
	7	SVX	64	2.64	0.16	
	8	VSVX	32	1.36	0.69	Discriminator Outputs for u - low gain (256 strips)
		VSVX	32	1.36	0.69	Discriminator Outputs for u - high gain (256 strips)
		VSVX	32	1.36	0.69	Discriminator Outputs for v - low gain (256 strips)
		VSVX	32	1.36	0.69	Discriminator Outputs for v - high gain (256 strips)
	9	VSVX	96	3.92	1.92	Cluster lists sent to L2
		VSVX	8	0.40	0.40	FE Board Monitoring data
	Total		744	34.68	10.16	

NOTE: The Readout Time column already assums zero-suppress mode because it shows the readout time for the bonded channels only. In non-zero-suppress mode each SVX has 128 channels and takes 5.12 usec

NOTE: The Occ column uses the fraction occupancy shown in the 2nd row for the channels. For the VSVX this occupancy value is multiplied by 16 as a guess at the relative length of these for any given occupancy value.