DAQ Map of Electronic Components

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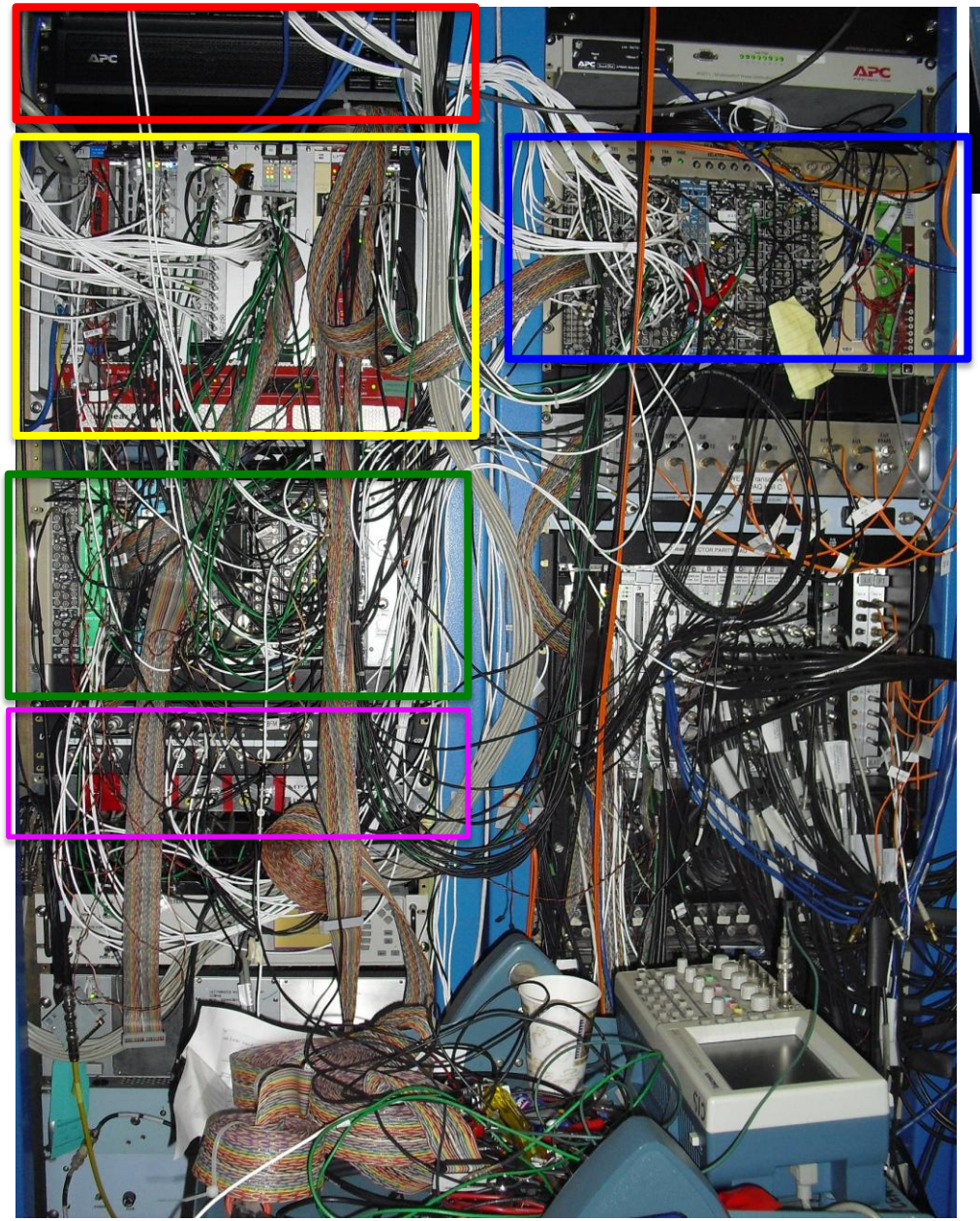
PEPPo/Mott DAQ



Module	Rack
Opsmdaq1 + UPS	INO2B23
opsmdaq0	INO3B24
VME crate	INO2B23
Mott NIM crate	INO2B23
PEPPo NIM crate	INO2B24
BPM/PEPPo signal patch panels	INO2B23
PEPP HV supply	INO2B21

In the slides we will refer to

- PEPPo NIM crate as PEPPo crate
- Mott NIM crate as Mott crate

PEPPo/Mott DAQ crates

VME crate

Rack	Crate	Slot	Board
INO2B23	VME	1	MVME 6100
INO2B23	VME	2	Old TI
INO2B23	VME	3	Lemo/Ecl translator CAEN V538A
INO2B23	VME	4	New TI
INO2B23	VME	5	Distribution Board 1
INO2B23	VME	6	Mott FADC (HALL D)
INO2B23	VME	7	PEPPo FADC (Hall D)
INO2B23	VME	8	Empty
INO2B23	VME	9	Distribution Board 2
INO2B23	VME	10	PEPPo FADC (PEPPo firmware)
INO2B23	VME	11	Empty
INO2B23	VME	12	Empty
INO2B23	VME	13	Scaler S2
INO2B23	VME	14	Scaler S1
INO2B23	VME	15	Empty
INO2B23	VME	16	40 MH clock
INO2B23	VME	17	TDC CAEN V775
INO2B23	VME	18	CAEN discriminator V895
INO2B23	VME	19	Empty
INO2B23	VME	20	JLab discriminator

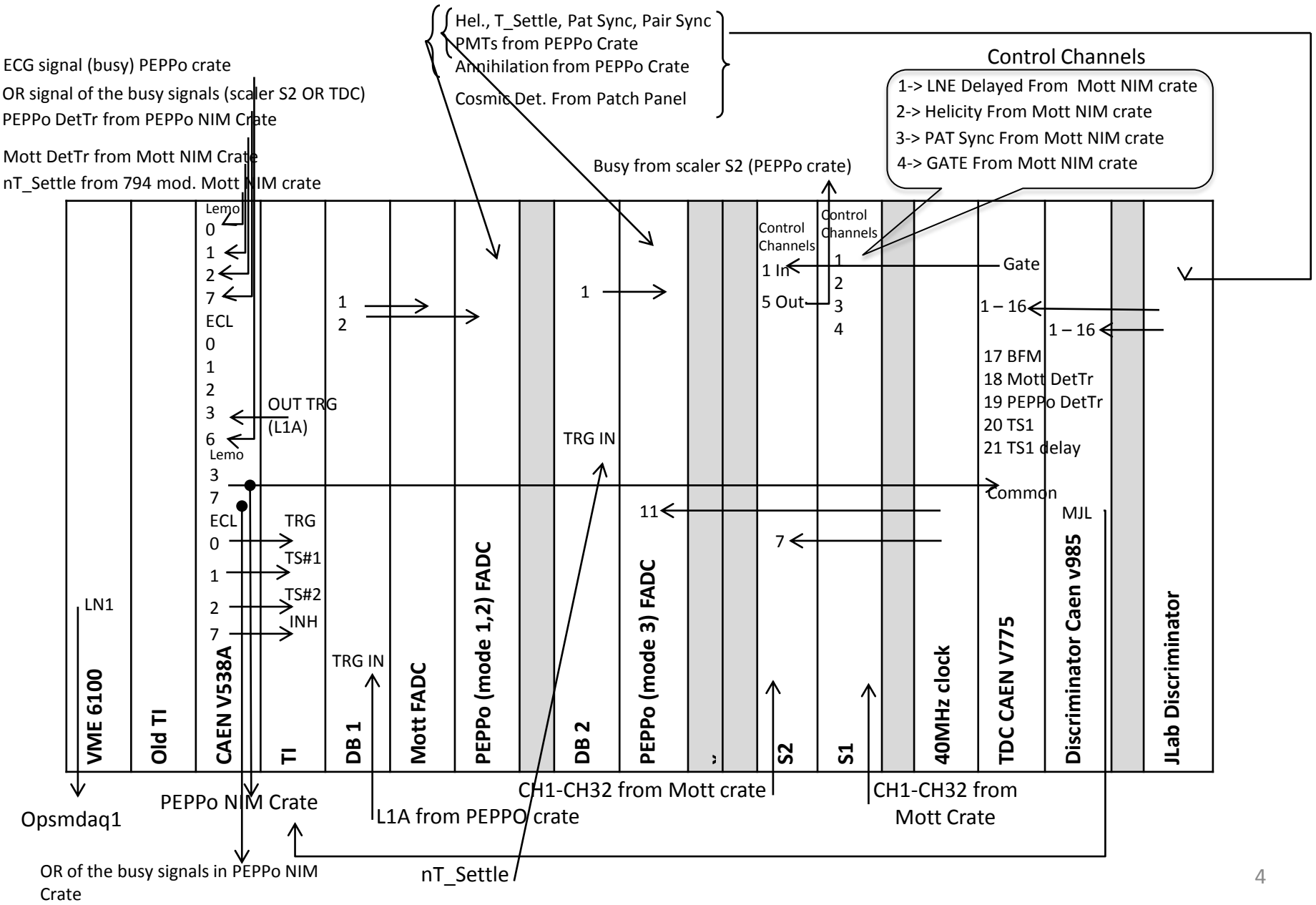
Mott crate

Rack	Crate	Slot	Board
INO2B23	Mott NIM	1	QUAD GateDelay Generator PS794
INO2B23	Mott NIM	2	VtoF (+/-7 V)
INO2B23	Mott NIM	3	LEVEL TRANSLATOR PS726
INO2B23	Mott NIM	4	VtoF (+/-10 V)
INO2B23	Mott NIM	5	LEVEL TRANSLATOR PS726
INO2B23	Mott NIM	6	LEVEL TRANSLATOR PS726
INO2B23	Mott NIM	7	Empty
INO2B23	Mott NIM	8	LINEAR FAN IN/OUT PS740
INO2B23	Mott NIM	9	DISCRIMINATOR PS708
INO2B23	Mott NIM	10	QUAD Gate/Delay Generator PS794
INO2B23	Mott NIM	11	LOGIC FAN IN/OUT LeCroy429A
INO2B23	Mott NIM	12	VtoF (single Chan) 10V

PEPPo crate

Rack	Crate	Slot	Board
INO2B24	PEPPo NIM	1	Level Translator PS 794
INO2B24	PEPPo NIM	2	Linear Fan In/Out PS740
INO2B24	PEPPo NIM	3	Linear Fan In/Out PS740
INO2B24	PEPPo NIM	4	Linear Fan In/Out PS740
INO2B24	PEPPo NIM	5	Logic fan in/out LeCroy429A
INO2B24	PEPPo NIM	6	Quad Gate/DELAY Generator PS794
INO2B24	PEPPo NIM	7	Octal Unit PS758 **AND**
INO2B24	PEPPo NIM	8	Octal Unit PS758 **OR**
INO2B24	PEPPo NIM	9	5 channels discriminator PS715
INO2B24	PEPPo NIM	10	Delayer PEC
INO2B24	PEPPo NIM	11	
INO2B24	PEPPo NIM	12	LV board

VME COMMON CRATE



Boards of the VME COMMON CRATE (1)

Emerson VME 6100, Slot 1	
Channels	**Output**
Debug	Empty
LN1	opsmdaq1
LN2	Empty

New Trigger Interface Board (TI), Slot 4			
Channel	**Type**	**Content**	**From/To**
TS#1	Input	Mott Detector trigger	VME crate CAEN V538A, Slot 3, Ch 1 Ecl (output)
TS#2	Input	PEPPo Detector trigger	VME crate CAEN, Slot 3, Ch 2 Ecl (output)
From TS#3 to TS#6	Input	Empty	
TRG	Input	nTSettle	VME crate CAEN V538A, Slot 3, Ch 0 Ecl (output)
INH	Input	ECG signal	VME crate CAEN V538A, Slot 3, Ch 7 Ecl (output)
OT#1	Output	Empty	
OT#2	Output	Empty	
From O4 to O1	Output	Empty	
TRG	Output	L1A	VME crate CAEN V538A, Slot 3, Ch 3 Ecl (Input)
BUSY	Output	Empty	

CAEN V538A Lemo/Ecl translator , Slot 2			
Channels	**Type**	**Content**	**From/To**
0	Lemo Input	nTSettle	Mott crate Quad gen. PS 794 Slot 11 CH1 (output)
1	Lemo Input	Mott Detector Trigger	Mott crate Level translator Slot 6 ch 11 (output)
2	Lemo Input	PEPPo Detector trigger	PEPPo crate Logic fan in/out LeCroy429A Slot 5 Ch 4 (output)
From 3 to 6	Lemo Input	Empty	
7	Lemo Input	OR of TDC and S1 busy signal	PEPPo crate Octal Unit PS 758(OR) Slot 8 Ch 8 (output)
From 0 to 2	Ecl Input	Empty	
3	Ecl Input	L1A	VME Crate New TI, Slot 4 Ch Out TRG (output)
From 4 to 5	Ecl Input	Empty	
6	Ecl Input	ECG signal	VME crate TDC V775 Slot 17 Ecl control busy (output)
7	Ecl Input	Empty	
0	Ecl Output	nTSettle	VME Crate New TI, Slot 4 Ch TRG (input)
1	Ecl Output	Mott Detector Trigger	VME Crate New TI, Slot 4 Ch TS#1 (input)
2	Ecl Output	PEPPo Detector trigger	VME Crate New TI, Slot 4 Ch TS#2 (input)
From 3 to 6	Ecl Output	Empty	
7	Ecl Output	PEPPo Detector trigger	VME Crate New TI, Slot 4 Ch INH (input)
From 0 to 2	Lemo Output	Empty	
3	Lemo Output (A and B)	L1A	(A) PEPPo NIM crate, Login fan In/Out Lecroy 429A Slot 6 Ch3 (input) (B) TDC CAEN V775 VME crate, Slot 17 Ch common (input)
From 4 to 5	Empty		
6	Lemo Output	OR of Busy signals	PEPPo NIM Crate Octal Unit PS 750 (OR), Slot 8 Ch 6 in (input)
7	Lemo Output	Empty	
Common	Lemo	Empty	

Boards of the VME COMMON CRATE (2)

Distribution Board (DB) 1, Slot 5			
Channel	**Type**	**Content**	**From/To**
1	Output		VME crate, Mott FADC board, Slot 6 (input)
2	Output		VME crate, PEPPo FADC board, Slot 7 (input)
From 3 to 7	Output	Empty	
CLK	Ecl output	Empty	
CND	Ecl output	Empty	
Sync	Ecl output	Empty	
TRG	Ecl output	Empty	
BSY	Ecl output	Empty	
CLK/GND	Lemo Input	Empty	
Sync In	Lemo Input	Empty	
TRG IN	Lemo Input	L1A	PEPPo crate, Mod 794, Slot 6 Ch 3 (output)
Busy Out	Lemo Input	Empty	
MTP2	Ecl	Empty	
From MT7 to MT1	Ecl	Empty	

Distribution Board (DB) 2, Slot 9			
Channel	**Type**	**Content**	**From/To**
1	Output		VME crate, PEPPo FADC board, Slot 10 (input)
From 2 to 7	Output	Empty	
CLK	Ecl output	Empty	
CND	Ecl output	Empty	
Sync	Ecl output	Empty	
TRG	Ecl output	Empty	
BSY	Ecl output	Empty	
CLK/GND	Lemo Input	Empty	
Sync In	Lemo Input	Empty	
TRG IN	Lemo Input	nTSettle	Level translator Mott Crate Slot 6 Ch15 (output)
Busy Out	Lemo Input	Empty	
MTP2	Ecl	Empty	
From MT7 to MT1	Ecl	Empty	

Boards of the VME COMMON CRATE (3)

FADC Mott

FADC Chan	Signal	From
First		Distribution board link, VME crate Slot 5, Ch 1
0	E LEFT	Mott
1	E RIGHT	Mott
2	E UP	Mott
3	E DOWN	Mott
4	ΔE LEFT	Mott
5	ΔE RIGHT	Mott
6	ΔE UP	Mott
7	ΔE DOWN	Mott
8	BFM	Mott crate, Quad Lin Fan in/out PS 740 Slot 8 CH 1
9		
10	Mott DetTr	Mott crate, Linear translator PS 726, Slot 6 Ch 11
11		
12	Delayed Helicity	Mott crate, Linear translator PS 726, Slot 6 Ch 1
13	T_Settle	Mott crate, Linear translator PS 726, Slot 6 Ch 3
14	Pattern-Sync	Mott crate, Linear translator PS 726, Slot 6 Ch 4
15	Pair-Sync	Mott crate, Linear translator PS 726, Slot 6 Ch 5

FADC PEPPo Mode 1&2

FADC Chan	Signal	From
First		Distribution board link, VME crate Slot 5, Ch 2
0	PMT1	Linear Fan in/out, Slot 2 Ch3
1	PMT2	Linear Fan in/out, Slot 2 Ch4
2	PMT3	Linear Fan in/out Slot 3, Ch1
3	PMT4	Linear Fan in/out, Slot 3 Ch2
4	PMT5	Linear Fan in/out Slot 3, Ch 3
5	PMT6	Linear Fan in/out, Slot 3, Ch 4
6	PMT7	Linear fan in/out Slot 4, Ch1
7	PMT8	Linear Fan in/out, Slot 3, Ch2
8	PMT9	Linear Fan in/out, Slot 4 Ch4
9	PEPPo DetTr	PEPPo crate, Lin fan in/out LeCroy 429A Slot 5 Ch 4 out
10	Delayed Helicity	Mott crate, Linear translator PS 726, Slot 6 Ch 1 out
11	T_Settle	Mott crate, Logic Fan in/out LeCroy 429A Slot 11 Ch 2
12	Pattern-Sync	Mott crate, Logic Fan in/out LeCroy 429A Slot 11 Ch 3
13	Pair Sync	Mott crate, Logic Fan in/out LeCroy 429A Slot 11 Ch 4
14	A1/TS1	Linear Fan in/out, Slot 2 Ch1
15	A3/Battery/E1	Linear Fan in/out, Slot 2 Ch2

FADC PEPPo Mode 3

FADC Chan	Signal	From
First		Distribution board link, VME crate Slot 9, Ch 1
0	PMT1	Linear Fan in/out, Slot 2 Ch3
1	PMT2	Linear Fan in/out, Slot 2 Ch4
2	PMT3	Linear Fan in/out, Slot 3, Ch1
3	PMT4	Linear Fan in/out, Slot 23 Ch2
4	PMT5	Linear Fan in/out, Slot 3, Ch 3
5	PMT6	Linear Fan in/out, Slot 3, Ch 4
6	PMT7	Linear Fan in/out, Slot 4, Ch1
7	PMT8	Linear Fan in/out, Slot 3, Ch2
8	PMT9	Linear Fan in/out, Slot 4 Ch 4
9	Battery	
10	Empty	
11	40 MHz Clock	40MHz Clock VME crate, Slot 16
12	Delayed Helicity	Mott crate, Linear translator PS 726, Slot 6 Ch 1
13	T_Settle	Mott crate, Linear translator PS 726, Slot 6 Ch 3
14	Pattern-Sync	Mott crate, Linear translator PS 726, Slot 6 Ch 4
15	Pair-Sync	Mott crate, Linear translator PS 726, Slot 6 Ch 5

Boards of the VME COMMON CRATE (4)

Scaler S1, Slot 14		
Channel	**Signal**	**From**
1 control	LNE (nTSettle)	Mott crate, Quad delay 794, Slot 9 Ch 2 out
2 control	Delayed helicity	Mott crate, Logic Fan in/out Lecroy 429A Slot 11 Ch 1 out
3 control	Pattern Sync	Mott crate, Logic Fan in/out Lecroy 429A Slot 11 Ch 3 out
4 control	Pair Sync	Mott crate, Level translator PS 726, Slot 6 Ch 15
From 5 to 8	Empty	
1	BCM0L02	Mott crate, Level translator PS 726, Slot 6 Ch 8 Ecl
2	TS1	Mott crate, Level translator PS 726, Slot 6 Ch 2 Ecl
3	Mott DetTr	Mott crate, Level translator PS 726, Slot 6 Ch 3 Ecl
4	121 kHz Clock	Mott crate, Level translator PS 726, Slot 6 Ch 4 Ecl
5	PEPPo DetTr	Mott crate, Level translator PS 726, Slot 6 Ch 5 Ecl
6	L1A	Mott crate, Level translator PS 726, Slot 6 Ch 6 Ecl
7	Battery	Mott crate, Level translator PS 726, Slot 5 Ch 4 Ecl
8	PMT1	Mott crate, Level Translator PS 794, Slot 3 Ch8 Ecl
9	PMT2	Mott crate, Level Translator PS 794, Slot 3 Ch9 Ecl
10	PMT3	Mott crate, Level Translator PS 794, Slot 3 Ch10 Ecl
11	PMT4	Mott crate, Level Translator PS 794, Slot 3 Ch11 Ecl
12	PMT5	Mott crate, Level Translator PS 794, Slot 3 Ch12 Ecl
13	PMT6	Mott crate, Level Translator PS 794, Slot 3 Ch13 Ecl
14	PMT7	Mott crate, Level Translator PS 794, Slot 3 Ch14 Ecl
15	PMT8	Mott crate, Level Translator PS 794, Slot 3 Ch15 Ecl
16	PMT9	Mott crate, Level Translator PS 794, Slot 3 Ch16 Ecl
17	BPM 0L01 X+	Mott crate, Level Translator PS 794, Slot 2 Ch 1 Ecl
18	BPM 0L01 X-	Mott crate, Level Translator PS 794, Slot 2 Ch 2 Ecl
19	BPM 0L01 Y+	Mott crate, Level Translator PS 794, Slot 2 Ch 3 Ecl
20	BPM 0L01 Y-	Mott crate, Level Translator PS 794, Slot 2 Ch 4 Ecl
21	BPM 0L02 X+	Mott crate, Level Translator PS 794, Slot 2 Ch 5 Ecl
22	BPM 0L02 X-	Mott crate, Level Translator PS 794, Slot 2 Ch 6 Ecl
23	BPM 0L02 Y+	Mott crate, Level Translator PS 794, Slot 2 Ch 7 Ecl
24	BPM 0L02 Y-	Mott crate, Level Translator PS 794, Slot 2 Ch 8 Ecl
25	BPM 5D00 X+	Mott crate, Level Translator PS 794, Slot 2 Ch 9 Ecl
26	BPM 5D00 X-	Mott crate, Level Translator PS 794, Slot 2 Ch 10 Ecl
27	BPM 5D00 Y+	Mott crate, Level Translator PS 794, Slot 2 Ch 11 Ecl
28	BPM 5D00 Y-	Mott crate, Level Translator PS 794, Slot 2 Ch 12 Ecl
29	BPM 5D01 X+	Mott crate, Level Translator PS 794, Slot 2 Ch 13 Ecl
30	BPM 5D01 X-	Mott crate, Level Translator PS 794, Slot 2 Ch 14 Ecl
31	BPM 5D01 Y+	Mott crate, Level Translator PS 794, Slot 2 Ch 15 Ecl
32	BPM 5D01 Y-	Mott crate, Level Translator PS 794, Slot 2 Ch 16 Ecl

Scaler S2, Slot 13		
Channel	**Signal**	**From/To**
1 control	LNE (L1A)	VME crate, TDC v775, Slot 17 Ch gate/common lemo (out)
From 2 to 4 control	Empty	
5 control output	S2 Busy	PEPPo crate, Octal logic unit (OR), Slot 8 Ch 8 (input)
From 6 to 8 control	Empty	
1	BCM0L02	Mott crate, Level translator PS 726, Slot 6 Ch 8 (out)
2	TS1	Mott crate, Level translator PS 726, Slot 6 Ch 2 (out)
3	Mott DetTr	Mott crate, Level translator PS 726, Slot 6 Ch 3 (out)
4	121 kHz Clock	Mott crate, Level translator PS 726, Slot 6 Ch 4 (out)
5	PEPPo DetTr	Mott crate, Level translator PS 726, Slot 6 Ch 5 (out)
6	L1A	Mott crate, Level translator PS 726, Slot 6 Ch 6 (out)
7	Battery	Mott crate, Level translator PS 726, Slot 5 Ch 4 (out)
8	40 MHz Clock	VME crate, 40 MHz clock, Slot 16
From 9 to 12	Empty	
13	Delayed Helicity	Mott crate, Logic Fan in/out LeCroy 429A, Slot 11, Ch 1 (out)
14	T_Settle	Mott crate, Logic Fan in/out LeCroy 429A, Slot 11, Ch 2 (out)
15	nPattern Sync	Mott crate, Logic Fan in/out LeCroy 429A, Slot 11, Ch 3 (out)
16	Pair Sync	Mott crate, Logic Fan in/out LeCroy 429A, Slot 11, Ch 4 (out)
17	Coil 2	Mott crate, Level translator PS726, Slot 5 Ch 5 (out)
18	Coil 3	Mott crate, Level translator PS726, Slot 5 Ch 6 (out)
19	Coil 4	Mott crate, Level translator PS726, Slot 5 Ch 7 (out)
20	MBA5D05 (An. Magnet)	Mott crate, Level translator PS726, Slot 5 Ch 8 (out)
21	Empty	
22	A1	Mott crate, Level Translator PS 794, Slot 2 Ch10 (out)
23	A3	Mott crate, Level Translator PS 794, Slot 2 Ch11 (out)
24	PMT1	Mott crate, Level Translator PS 794, Slot 2 Ch1 (out)
25	PMT2	Mott crate, Level Translator PS 794, Slot 2 Ch2 (out)
26	PMT3	Mott crate, Level Translator PS 794, Slot 2 Ch3 (out)
27	PMT4	Mott crate, Level Translator PS 794, Slot 2 Ch4 (out)
28	PMT5	Mott crate, Level Translator PS 794, Slot 2 Ch5 (out)
29	PMT6	Mott crate, Level Translator PS 794, Slot 2 Ch6 (out)
30	PMT7	Mott crate, Level Translator PS 794, Slot 2 Ch7 (out)
31	PMT8	Mott crate, Level Translator PS 794, Slot 2 Ch8 (out)
32	PMT9	Mott crate, Level Translator PS 794, Slot 2 Ch9 (out)

Boards of the VME COMMON CRATE (5)

CAEN V895 Discriminator, Slot 18		
Channel	**Signal**	**From**
0	PMT1	PEPPo crate, Level Translator PS 794, Slot 1, Ch 1 out
1	PMT2	PEPPo crate, Level Translator PS 794, Slot 1, Ch 2 out
2	PMT3	PEPPo crate, Level Translator PS 794, Slot 1, Ch 3 out
3	PMT4	PEPPo crate, Level Translator PS 794, Slot 1, Ch 4 out
4	PMT5	PEPPo crate, Level Translator PS 794, Slot 1, Ch 5 out
5	PMT6	PEPPo crate, Level Translator PS 794, Slot 1, Ch 6 out
6	PMT7	PEPPo crate, Level Translator PS 794, Slot 1, Ch 7 out
7	PMT8	PEPPo crate, Level Translator PS 794, Slot 1, Ch 8 out
8	PMT9	PEPPo crate, Level Translator PS 794, Slot 1, Ch 9 out
9	A1/TS1	PEPPo crate, Level Translator PS 794, Slot 1, Ch 10 out
10	A3/E1	PEPPo crate, Level Translator PS 794, Slot 1, Ch 11 out
11	COSMIC1	PEPPo crate, Level Translator PS 794, Slot 1, Ch 12 out
12	COSMIC2	PEPPo crate, Level Translator PS 794, Slot 1, Ch13 out
13	COSMIC3	PEPPo crate, Level Translator PS 794, Slot 1, Ch 14 out
14	COSMIC4	PEPPo crate, Level Translator PS 794, Slot 1, Ch 15 out
15	COSMIC5	PEPPo crate, Level Translator PS 794, Slot 1, Ch 16 out
Channel	**Signal**	**To**
MJL	MJL	PEPPo crate, Locic Fan in/out (OR) LeCroy429A, Slot 5 Ch 2 (input)

CAEN TDC V775, Slot 17		
Channel	**Signal**	**From**
1	PMT1	VME crate, JLab discriminator, Slot 20 Ch TR 1 out
2	PMT2	VME crate, JLab discriminator, Slot 20 Ch TR 2 out
3	PMT3	VME crate, JLab discriminator, Slot 20 Ch TR 3 out
4	PMT4	VME crate, JLab discriminator, Slot 20 Ch TR 4 out
5	PMT5	VME crate, JLab discriminator, Slot 20 Ch TR 5 out
6	PMT6	VME crate, JLab discriminator, Slot 20 Ch TR 6 out
7	PMT7	VME crate, JLab discriminator, Slot 20 Ch TR 7 out
8	PMT8	VME crate, JLab discriminator, Slot 20 Ch TR 8 out
9	PMT9	VME crate, JLab discriminator, Slot 20 Ch TR 9 out
10	A1/TS1	VME crate, JLab discriminator, Slot 20 Ch TR 10 out
11	A3/E1	VME crate, JLab discriminator, Slot 20 Ch TR 11 out
12	COSMIC1	VME crate, JLab discriminator, Slot 20 Ch TR 12 out
13	COSMIC2	VME crate, JLab discriminator, Slot 20 Ch TR 13 out
14	COSMIC3	VME crate, JLab discriminator, Slot 20 Ch TR 14 out
15	COSMIC4	VME crate, JLab discriminator, Slot 20 Ch TR 15 out
16	COSMIC5	VME crate, JLab discriminator, Slot 20 Ch TR 16 out
17	BFM	Mott crate, Level translator, Slot 6 Ch 7 out
18	Mott DerTr	Mott crate, Level translator, Slot 6 Ch 9 out
19	PEPPo DetTr	Mott crate, Level translator, Slot 5 Ch 9 out
20	TS1	Mott crate, Level translator, Slot 5 Ch 18 out
21	TS1B	PEPPo crate, PEC Slot 10 + 11
From 22 to 32	Empty	

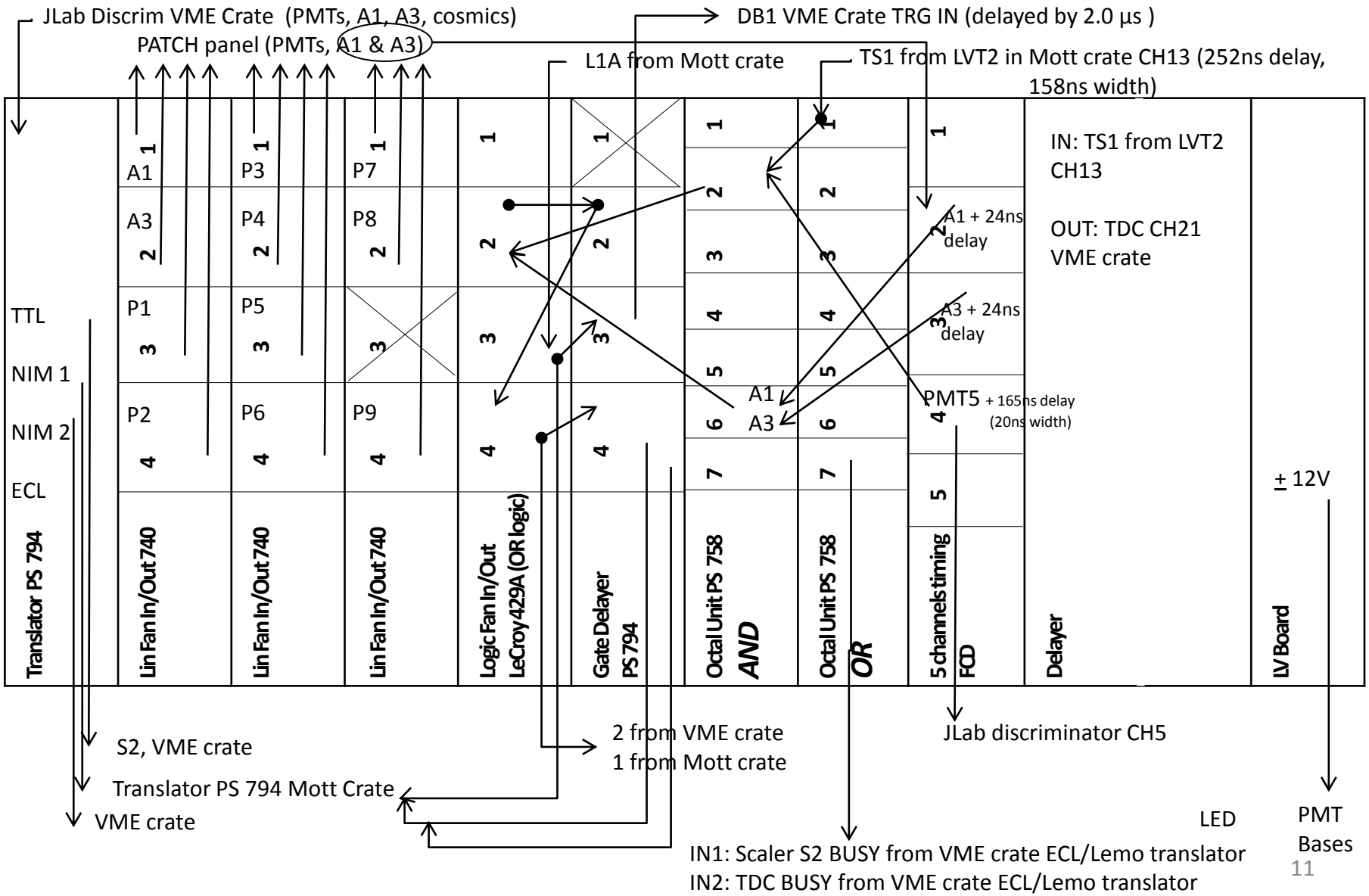
Boards of the VME COMMON CRATE (6)

JLab discrimnator, Slot 20

Channel	Type	Signal	From
1	Lemo input	PMT1	PEPPo crate Linear Fan in/out, Slot 2 Ch 3 out
2	Lemo input	PMT2	PEPPo crate Linear Fan in/out, Slot 2 Ch 4 out
3	Lemo input	PMT3	PEPPo crate Linear Fan in/out, Slot 2 Ch 5 out
4	Lemo input	PMT4	PEPPo crate Linear Fan in/out, Slot 2 Ch 6 out
6	Lemo input	PMT6	PEPPo crate Linear Fan in/out, Slot 2 Ch 8 out
7	Lemo input	PMT7	PEPPo crate Linear Fan in/out, Slot 2 Ch 9 out
8	Lemo input	PMT8	PEPPo crate Linear Fan in/out, Slot 2 Ch 10 out
9	Lemo input	PMT9	PEPPo crate Linear Fan in/out, Slot 2 Ch 11 out
10	Lemo input	A1/TS1	PEPPo crate Linear Fan in/out, Slot 2 Ch 1 out
11	Lemo input	A3/E1	PEPPo crate Linear Fan in/out, Slot 2 Ch 2 out
12	Lemo input	COSMIC1	PEPPo crate Level Translator PS 794, Slot 2 Ch 12 out
13	Lemo input	COSMIC2	PEPPo crate Level Translator PS 794, Slot 2 Ch 13out
14	Lemo input	COSMIC3	PEPPo crate Level Translator PS 794, Slot 2 Ch 14 out
15	Lemo input	COSMIC4	PEPPo crate Level Translator PS 794, Slot 2 Ch 15 out
16	Lemo input	COSMIC5	PEPPo crate Level Translator PS 794, Slot 2 Ch 16 out

Channel	Type	Signal	To
1	TDC Ecl output	PMT1	VME crate, TDC CAEN V775, Slot 18, Ch 1
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH1
2	TDC Ecl output	PMT2	VME crate, TDC CAEN V775, Slot 18, Ch 2
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH2
3	TDC Ecl output	PMT3	VME crate, TDC CAEN V775, Slot 18, Ch 3
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH3
4	TDC Ecl output	PMT4	VME crate, TDC CAEN V775, Slot 18, Ch 4
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH4
5	TDC Ecl output	PMT5	VME crate, TDC CAEN V775, Slot 18, Ch 5
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH5
6	TDC Ecl output	PMT6	VME crate, TDC CAEN V775, Slot 18, Ch 6
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH6
7	TDC Ecl output	PMT7	VME crate, TDC CAEN V775, Slot 18, Ch 7
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH7
8	TDC Ecl output	PMT8	VME crate, TDC CAEN V775, Slot 18, Ch 8
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH8
9	TDC Ecl output	PMT9	VME crate, TDC CAEN V775, Slot 18, Ch 9
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH9
10	TDC Ecl output	A1/TS1	VME crate, TDC CAEN V775, Slot 18, Ch 10
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH10
11	TDC Ecl output	A3/E1	VME crate, TDC CAEN V775, Slot 18, Ch 11
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH11
12	TDC Ecl output	COSMIC1	VME crate, TDC CAEN V775, Slot 18, Ch 12
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH12
13	TDC Ecl output	COSMIC2	VME crate, TDC CAEN V775, Slot 18, Ch 13
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH13
14	TDC Ecl output	COSMIC3	VME crate, TDC CAEN V775, Slot 18, Ch 14
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH14
15	TDC Ecl output	COSMIC4	VME crate, TDC CAEN V775, Slot 18, Ch 15
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH15
16	TDC Ecl output	COSMIC5	VME crate, TDC CAEN V775, Slot 18, Ch 16
	TRG Ecl output		PEPPo crate, Level Translator PS 794, Slot 1, CH16
	OR	Or signal	PEPPo crate, Octal Logic unit PS758 (AND) Slot 7 Ch 1

PEPPo NIM Crate



PEPPo NIM Crate Boards (1)

Level translator PS794, Slot 1				
FADC Chan	**Signal**	**From**	**Output type**	**To**
1	PMT1	VME crate, JLAb discr, Slot 20, Ch 1 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 1
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 8
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch1
2	PMT2	VME crate, JLAb discr, Slot 20, Ch 2 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 2
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 9
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch2
3	PMT3	VME crate, JLAb discr, Slot 20, Ch 3 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 3
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 10
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch3
4	PMT4	VME crate, JLAb discr, Slot 20, Ch 4 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 4
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 11
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch4
5	PMT5	VME crate, JLAb discr, Slot 20, Ch 5 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 5
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 12
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch5
6	PMT6	VME crate, JLAb discr, Slot 20, Ch 6 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 6
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 13
			NIM2	VME crate, discriim. CAEN V895, Slot 18, Ch6
7	PMT7	VME crate, JLAb discr, Slot 20, Ch 7 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 7
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 14
			NIM2	VME crate, discriim. CAEN V895, Slot 18, Ch7
8	PMT8	VME crate, JLAb discr, Slot 20, Ch 8 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 8
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 15
			NIM2	VME crate, discriim. CAEN V895, Slot 18, Ch8
9	PMT9	VME crate, JLAb discr, Slot 20, Ch 9 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 9
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 16
			NIM2	VME crate, discriim. CAEN V895, Slot 18, Ch9

Level translator PS794, Slot 1				
FADC Chan	**Signal**	**From**	**Output type**	**To**
10	A1	VME crate, JLAb discr, Slot 20, Ch 10 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 10
			NIM1	Mott crate, Level Translator PS726, Slot 3 Ch 2
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch10
11	A3	VME crate, JLAb discr, Slot 20, Ch 11 Trg	TTL	VME crate, Scaler S2, Slot 13 Ch 11
			NIM1	Empty
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch11
12	COSMIC1	VME crate, JLAb discr, Slot 20, Ch 12 Trg	TTL	Empty
			NIM1	Empty
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch12
13	COSMIC2	VME crate, JLAb discr, Slot 20, Ch 13 Trg	TTL	Empty
			NIM1	Empty
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch13
14	COSMIC3	VME crate, JLAb discr, Slot 20, Ch 14 Trg	TTL	Empty
			NIM1	Empty
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch14
15	COSMIC4	VME crate, JLAb discr, Slot 20, Ch 15 Trg	TTL	Empty
			NIM1	Empty
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch15
16	COSMIC5	VME crate, JLAb discr, Slot 20, Ch 16 Trg	TTL	Empty
			NIM1	Empty
			NIM2	VME crate, discrim. CAEN V895, Slot 18, Ch16

PEPPo NIM Crate Boards (2)

Linear Fan In/Out (Slot 2)					
Channel	**Type**	**Signal**	**From**	**Type**	**To**
1	Input	A1	Patch Panel IN02B23 Ch A1	Output	VME crate Jlab discrim., Slot 20, Ch 10
					VME crate, PEPPo FADC Slot 7 Ch 14
2	Input	A3	Patch Panel IN02B23 Ch A3	Output	VME crate Jlab discrim., Slot 20, Ch 11
					VME crate, PEPPo FADC Slot 7 Ch 15
3	Input	PMT1	Patch Panel IN02B23 Ch P1	Output	VME crate Jlab discrim., Slot 20, Ch 1
					VME crate, PEPPo FADC Slot 7 Ch 1
					VME crate, PEPPo FADC Slot 10 Ch 1
4	Input	PMT2	Patch Panel IN02B23 Ch P2	Output	VME crate Jlab discrim., Slot 20, Ch 2
					VME crate, PEPPo FADC Slot 7 Ch 2
					VME crate, PEPPo FADC Slot 10 Ch 2

Linear Fan In/Out (Slot 3)					
Channel	**Type**	**Signal**	**From**	**Type**	**To**
1	Input	PMT3	Patch Panel IN02B23 Ch P3	Output	VME crate Jlab discrim., Slot 20, Ch 3
					VME crate, PEPPo FADC Slot 7 Ch 3
					VME crate, PEPPo FADC Slot 10 Ch 3
2	Input	PMT4	Patch Panel IN02B23 Ch P4	Output	VME crate Jlab discrim., Slot 20, Ch 4
					VME crate, PEPPo FADC Slot 7 Ch 4
					VME crate, PEPPo FADC Slot 10 Ch 4
3	Input	PMT5	Patch Panel IN02B23 Ch P5	Output	PEPPo crate, 5Ch. Diiscrim PS715, Slot 9 Ch 4
					VME crate, PEPPo FADC Slot 7 Ch 5
					VME crate, PEPPo FADC Slot 10 Ch 5
4	Input	PMT6	Patch Panel IN02B23 Ch P6	Output	VME crate Jlab discrim., Slot 20, Ch 6
					VME crate, PEPPo FADC Slot 7 Ch 6
					VME crate, PEPPo FADC Slot 10 Ch 6

Linear Fan In/Out (Slot 4)					
Channel	**Type**	**Signal**	**From**	**Type**	**To**
1	Input	PMT7	Patch Panel IN02B23 Ch P7	Output	VME crate Jlab discrim., Slot 20, Ch 7
					VME crate, PEPPo FADC Slot 7 Ch 7
					VME crate, PEPPo FADC Slot 10 Ch 7
2	Input	PMT8	Patch Panel IN02B23 Ch P8	Output	VME crate Jlab discrim., Slot 20, Ch 8
					VME crate, PEPPo FADC Slot 7 Ch 8
					VME crate, PEPPo FADC Slot 10 Ch 8
3	Input	Empty			
4	Input	PMT9	Patch Panel IN02B23 Ch P9	Output	VME crate Jlab discrim., Slot 20, Ch 9
					VME crate, PEPPo FADC Slot 7 Ch 9
					VME crate, PEPPo FADC Slot 10 Ch 9

PEPPo NIM Crate Boards (3)

Logic Linear fan in/out Lecroy 429A (OR) Slot 5					
Channel	**Type**	**Signal**	**From**	**Type**	**To**
1	Input	Empty			
2	Input(OR)	PEPPo Det. Trigger	PEPPo crate, Octal unit PS758, Slot 7 Ch 6 => **MJL**	Output	PEPPo crate, Quad gate/delay PS794, Slot 6 Ch 2
			PEPPo crate, Octal unit PS758, (AND) Slot 7 Ch2 => **PMT5&TS1**		
			PEPPo crate, Octal unit PS758, (AND) Slot 7 Ch6 => **A1&A3**		
3	Input	L1A	VME crate, CAEN V538A, Slot 3 Ch 3 lemo	Output	Mott crate, Level translator PS726, Slot 3 Ch 6
					PEPPo crate, Quad gate/delay PS794, Slot 6 Ch 3
4	Input	MJL Delayed	PEPPo crate, Quad gate/delay PS794, Slot 6 Ch 2	Output	VME crate, CAEN V538A, Slot 3 Ch2 lemo in
					Mott crate, Level translator PS726, Slot 3 Ch 5
					VME crate, PEPPo FADC Slot 7, Ch 10
					PEPPo crate, Quad gate /delay PS794, Slot 6 Ch 4

	Type	Signal	From	To
PEC, Slot 10+11	Delayer	TS1	Mott crate, Level translator PS726, Slot 5 Ch 9	VME crate, TDC CAEN V775, Slot 17 Ch 20
LV Board, Slot 12	Power supply	+/- 12V		PMT bases

5 channel discriminator (CFD) Slot 9					
Channel	**Type**	**Signal**	**From**	**Type**	**To**
1	Input	Empty			
2	Input	A1	PEPPo crate, Linear Fan in/out PS740, Slot 2 Ch 1	Output	PEPPo crate, Octal unit PS758, Slot 7 Ch 6
3	Input	A3	PEPPo crate, Linear Fan in/out PS740, Slot 2 Ch 2	Output	PEPPo crate, Octal unit PS758, Slot 7 Ch 6
4	Input	PMT5	PEPPo crate, Linear Fan in/out PS740, Slot 2 Ch 3	Output	PEPPo crate, Octal unit PS758, Slot 7 Ch 2
					VME crate, JLab discrim., Slot 20, Ch 5

Gate generator PS 794 Slot 6					
Channel	**Type**	**Signal**	**From**	**Type**	**To**
1	Input	Empty			
2	Input	PEPPo detector trigger	PEPPo crate, Logic fan in/out LeCroy 429A, Slot 5 Ch 2	Output	PEPPo crate, Logic fan in/out LeCroy 429A, Slot 5 Ch 4
3	Input	L1A	PEPPo crate, Logic fan in/out LeCroy 429A, Slot 5 Ch 3	Output	VME crate, Distribution Board 1, Slot 5 Ch TRG IN
4	Input	MJL	PEPPo crate, Logic fan in/out LeCroy 429A, Slot 5 Ch 4	Output	Mott crate, Level translator PS 726, Slot 5 Ch 9

PEPPo NIM Crate Boards (4)

Octal Logic Unit PS 758 (AND) Slot 7			
Channel	**Signal**	**From**	**To**
1	JLab OR signal	VME crate, Jlab discrim., Slot 20 Ch OR	
2	AND of PMT5 & TS1	PEPPo crate, 5CH. Discrim. PS715, Slot 9, Ch 4	PEPPo crate, Logic Fan in/out LeCroy 429A, Slot 5 Ch2
		PEPPo crate, Octal logic unit PS758, Slot 8 Ch 1	
3	Empty		
4	Empty		
5	Empty		
6	AND of A1 & A3	A1 => PEPPo crate, 5 CH discrim. PS715, Slot 9 Ch2	PEPPo crate, Logic Fan in/out LeCroy 429A, Slot 5 Ch2
		A3 => PEPPo crate, 5 CH discrim. PS715, Slot 9 Ch3	
7	Empty		
8	Empty		

Octal Logic Unit PS 758 (OR) Slot 8			
Channel	**Signal**	**From**	**To**
1	TS1	Mott crate, Level transltor PS726, Slot 6 Ch15 + Delaying cable	PEPPo crate, Octal unit PS758, Slot 7 Ch 2
2	Empty		
3	Empty		
4	Empty		
5	Empty		
6	Empty		
7	Empty		
8	Busy	VME crate, Scaler S2, Slot 13, Ch 5 control	VME crate, CAEN V538A, Slot 3 Ch 7
		VME crate, CAEN V538A, Slot 3 Ch6 lemo out	

Mott NIM Crate

QD 794	VtoF 1 MHz 0–10 V	LT1 726	VtoF 2 MHz -7 – +7 V	LT2 726	LT3 726		LIN 740	DISC 708	QD 794	FAN 429A	VtoF 1 MHz 0–10 V
→ Mott Trigger ← 322 ns LT3 Ch9	→ BPM Ch1-16 ← S1 Ch17-32						→ BFM -140 mV ← Ch8 FADC ← DISC	→ BMF -145 MV ← LT3 Ch7	→ nT_Settle ← 428 ns nT_Settle Trigger	→ Delayed Helicity	→ BCM 0L02 Output2 ← VtoF LT3 Ch8
									→ nT_Settle ← 180 ns S1 LNE	→ T_Settle	
									→ 4 MHz Clock 8.16 us ← 121.2 kHz Clock LT1 Ch4	→ Pattern Sync	
									→ TS1 LV2 Ch13 ← 812 ns LT2 Ch16	→ Pair Sync	

	11 Battery
	12 Coil2
	13 Coil3
	14 Coil4
	15 MPA5D05

Mott NIM – LEVEL TRANSLATOR 726

	LT1			
	NIM IN	ECL OUT	NIM OUT	NIM OUT
1	VtoF	S1 Ch1-16		
2	Scintillator (TS1)/A1			
3	Mott DetTr		50 Ω	S2 Ch3
4	121.2 kHz Clock		50 Ω	S2 Ch4
5	PEPPo DetTr		50 Ω	S2 Ch5
6	LA1		50 Ω	S2 Ch6
7	Battery			
8	PMT1			
9	PMT2			
10	PMT3			
11	PMT4			
12	PMT5			
13	PMT6			
14	PMT7			
15	PMT8			
16	PMT9			

Mott NIM – LEVEL TRANSLATOR 726

	LT2			
	NIM/ECL IN	ECL OUT	NIM OUT	NIM OUT
1	NIM Delayed Helicity		50 Ω	FADC2 Ch10
2				
3				
4	ECL Battery		LT1 Ch7	S2 Ch7
5	ECL Coil2		50 Ω	S2 Ch17
6	ECL Coil3		50 Ω	S2 Ch18
7	ECL Coil4		50 Ω	S2 Ch19
8	ECL MPA5D05		50 Ω	S2 Ch20
9	NIM PEPPo DetTr	TDC Ch19		
10				
11				
12				
13	TS1 (PEPPo LV1 A1)	Delay Box	QD 794 Ch4	PEPPo 758 Cable delay of 252 ns
14				
15				
16	TS1 delayed (QD740 Ch4)	TDC 20		

Mott NIM – LEVEL TRANSLATOR 726

	LT3			
	NIM IN	TTL/ECL OUT	NIM OUT	NIM OUT
1	Delayed Helicity	LT2 Ch1	Mott FADC Ch12	PEPPo FADC Ch12
2				
3	T_Settle		Mott FADC Ch13	PEPPo FADC Ch13
4	Pattern Sync		Mott FADC Ch14	PEPPo FADC Ch14
5	Pair Sync		Mott FADC Ch15	S2 Ch6
6				
7	BFM	TDC Ch17		
8	VtoF		LT1 Ch1	S2 Ch1
9	Delayed Mott DetTr	TDC Ch18		
10	Mott DetTr			CAEN V538A Ch1
11				Mott FADC Ch10
12				
13			LT1 Ch3	QUAD DELAY CH3
14				
15	nT_Settle		S1 GATE – Ch4	PEPPo FADC TRG IN
16	nT_Settle		QUAD DELAY CH1	QUAD DELAY CH2

Mott NIM – QUAD FAN IN/OUT 429A

QUAD FAN IN/OUT		
		Delayed Helicity – IN
S1 Control – Ch2	OUT2 – old Mott DAQ	OUT1 – old Mott DAQ
S2– Ch13		LT3 – CH1
		T_Settle – IN
S2– Ch14	LT3 – Ch15	FADC2 – Ch12
CAEN V538A – Ch6	LT3 – Ch16	LT3 – Ch3
		Pattern Sync – IN
S1 Control – Ch3	S2 – Ch15	FADC2 – Ch13
		LT3 – Ch4
		Pair Sync – IN
S2 – Ch16		FADC2 – Ch14
		LT3 – Ch5

CHANNEL ASSIGNMENT – CAEN V538A LEVEL TRANSLATOR

Chan	IN LEMO
7	
6	
5	
4	
3	
2	PEPPo DetTr
1	Mott DetTr
0	Delayed (0.4 µs) nT_Settle

Chan	OUT ECL	
7		
6		
5		
4		
3		
2	TID TS#2	
1	TID TS#1	
0	TID IN TRG	

Chan	IN ECL
7	
6	
5	
4	
3	TID OUT TRG (L1A)
2	
1	
0	

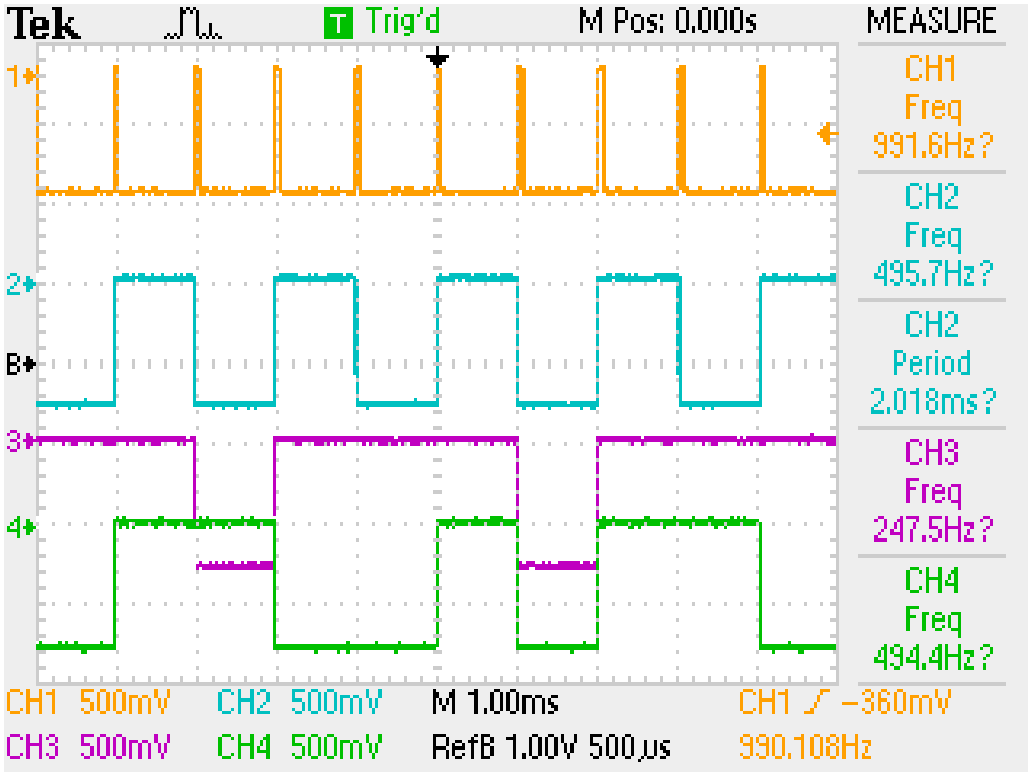
Chan	OUT LEMO	
7		
6		
5		
4		
3	LA1 (PEPPo NIM)	LA1 (TDC COMM)
2		
1		
0		

CHANNEL ASSIGNMENT – TRIGGER INTERFACE (TID)

TID Chan	IN Signal
7	
6	
5	
4	
3	
2	TS#2 (PEPPo DetTr)
1	TS#1 (Mott DetTr)
0	TRG (nT_Settle)

TID Chan	OUT Signal
7	
6	
5	
4	
3	
2	
1	TRG (L1A)
0	

HELICITY SIGNALS



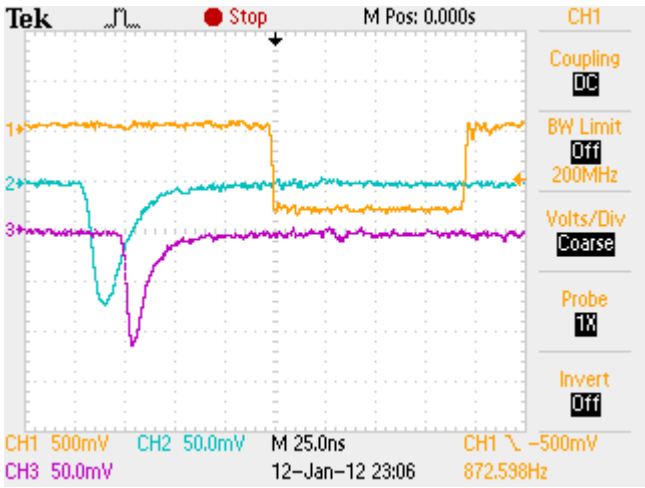
T_Settle

Pair -Sync

Pattern-Sync

Delayed Helicity

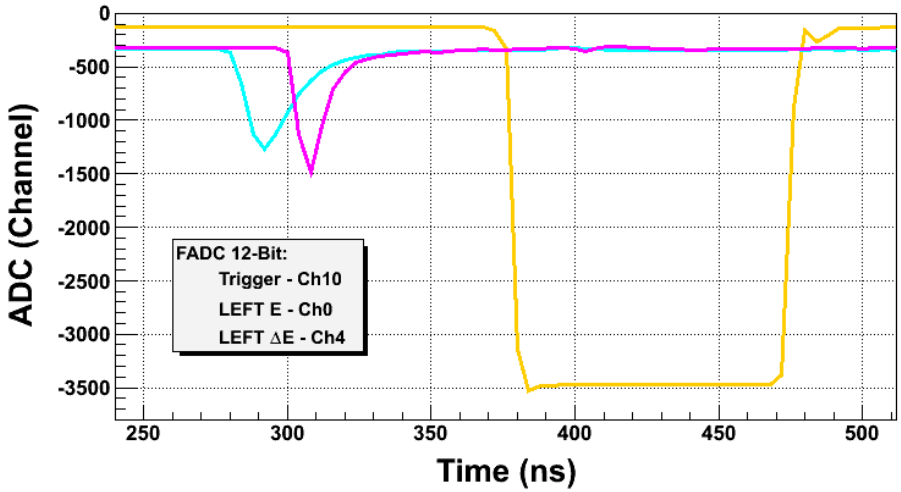
CHANNEL ASSIGNMENT – MOTT FADC



Mott Trigger

Left E

Left ΔE

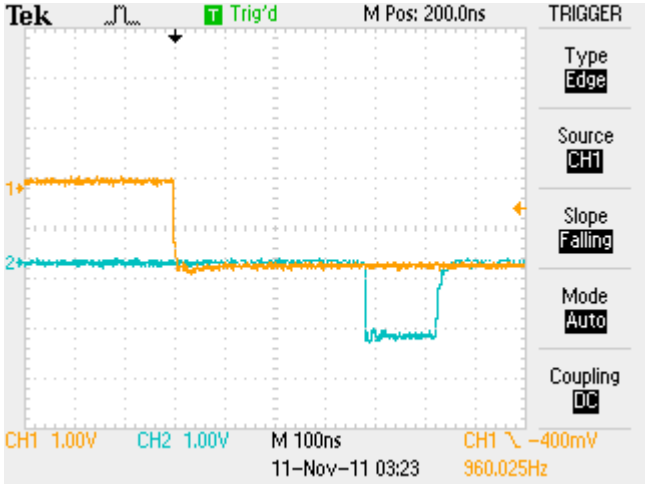


CONTROL CHANNEL ASSIGNMENT – GATED SCALER S1

S1 CONTROL Chan	Signal
1	Load-Next-Event (LNE)
2	Delayed Helicity
3	Pattern Sync
4	GATE (nT_Settle)

<u>nT_Settle_Trigger Setup:</u>

I. nT_Settle Trigger is delayed by 0.4 µs
II. LNE is delayed by 0.2 µs

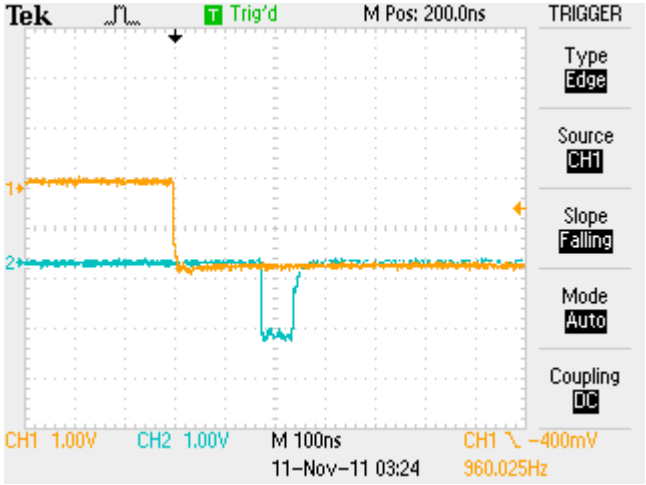


nT_Settle

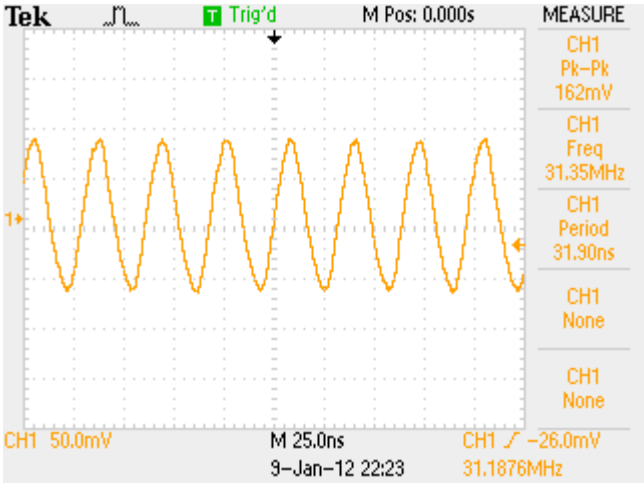
Delayed
TID nT_Settle
Trigger
(Scalers and PEPPo_Int)

nT_Settle

LNE

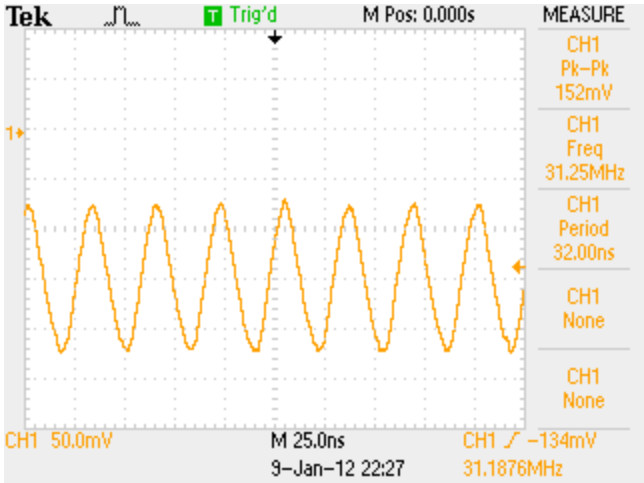


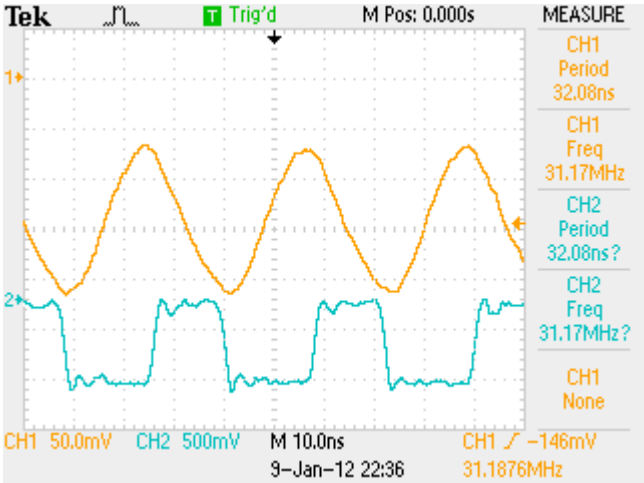
Beat Frequency Modulation (BFM)



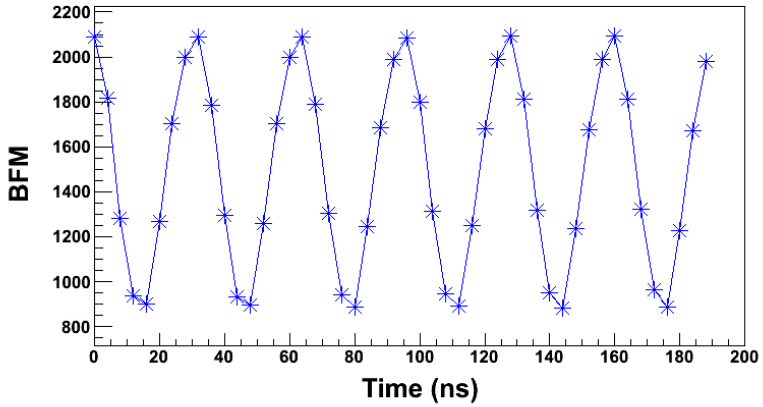
BFM

BFM after
-140 mV offset





BFM after
-145 mV discrimination (TDC)

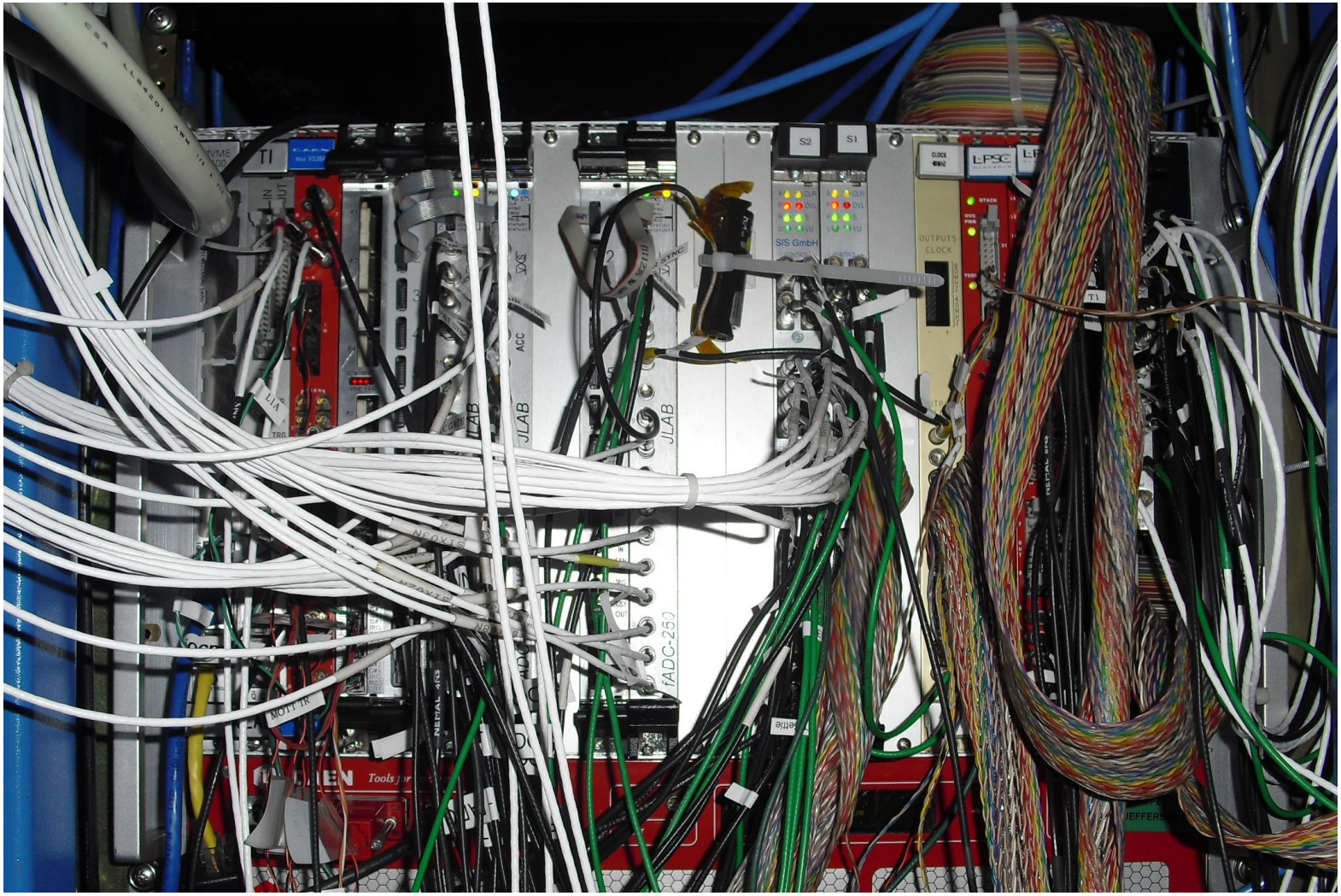
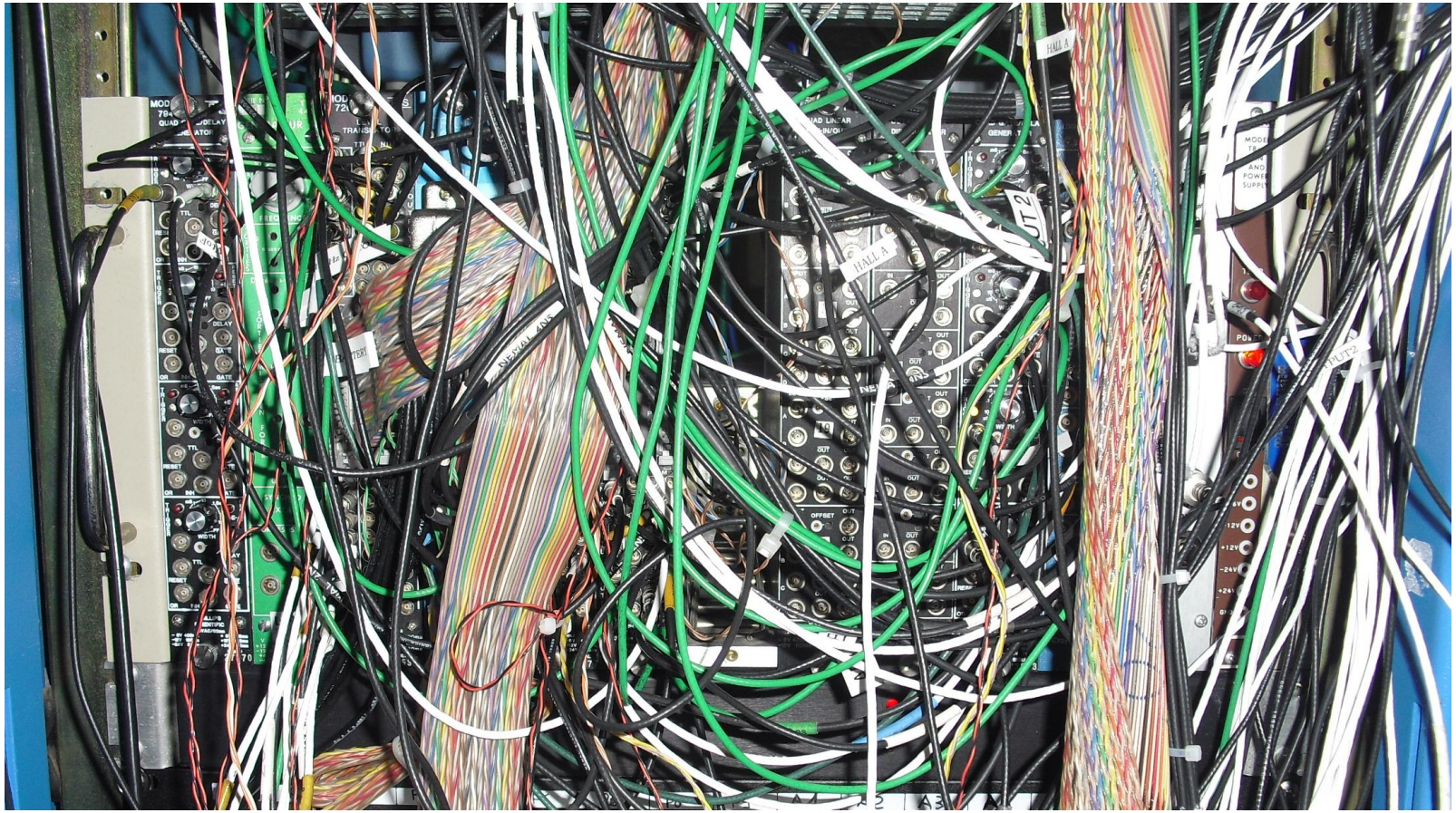


BFM in FADC

Data Taking Modes

Name	Included Modules	Output	Trigger
Scalers	Scaler S1 (helicity gated), S2 (ungated)	Scalers_%d.dat	Delayed nT_Settle
Mott_Sample	Mott FADC(1), S1, S2, TDC	Mott_Sample_%d.dat	Mott Detector
FADC_Int	PEPPo FADC(3), S1, S2, JLab discriminator	PEPPo_Int_%d.dat	Delayed nT_Settle

VME Crate



Mott Crate