# *Description of Hardware of UITF 200 keV Mott DAQ*

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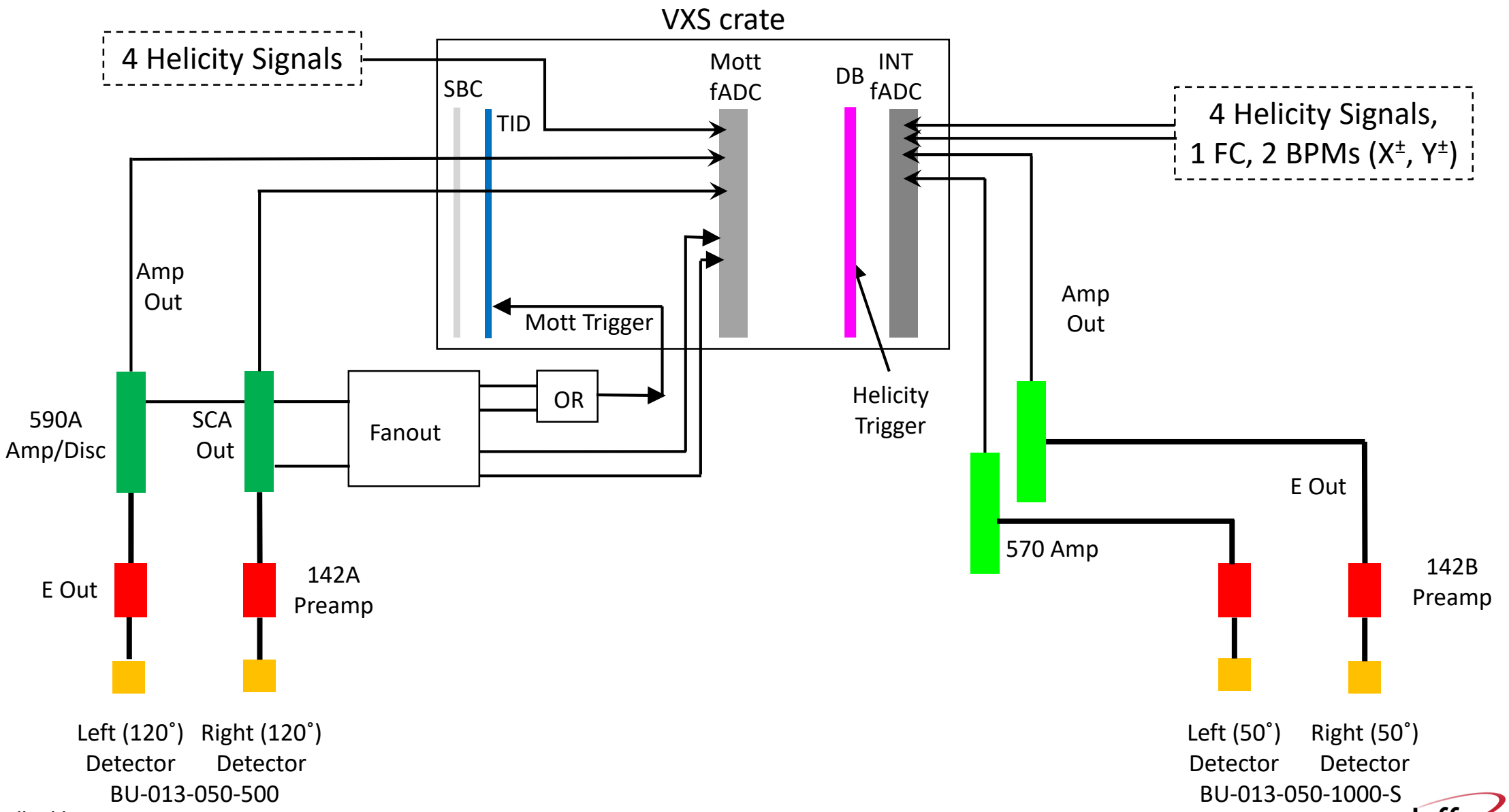
JSA

# Upgraded Injector Test Facility – Mott Data Acquisition

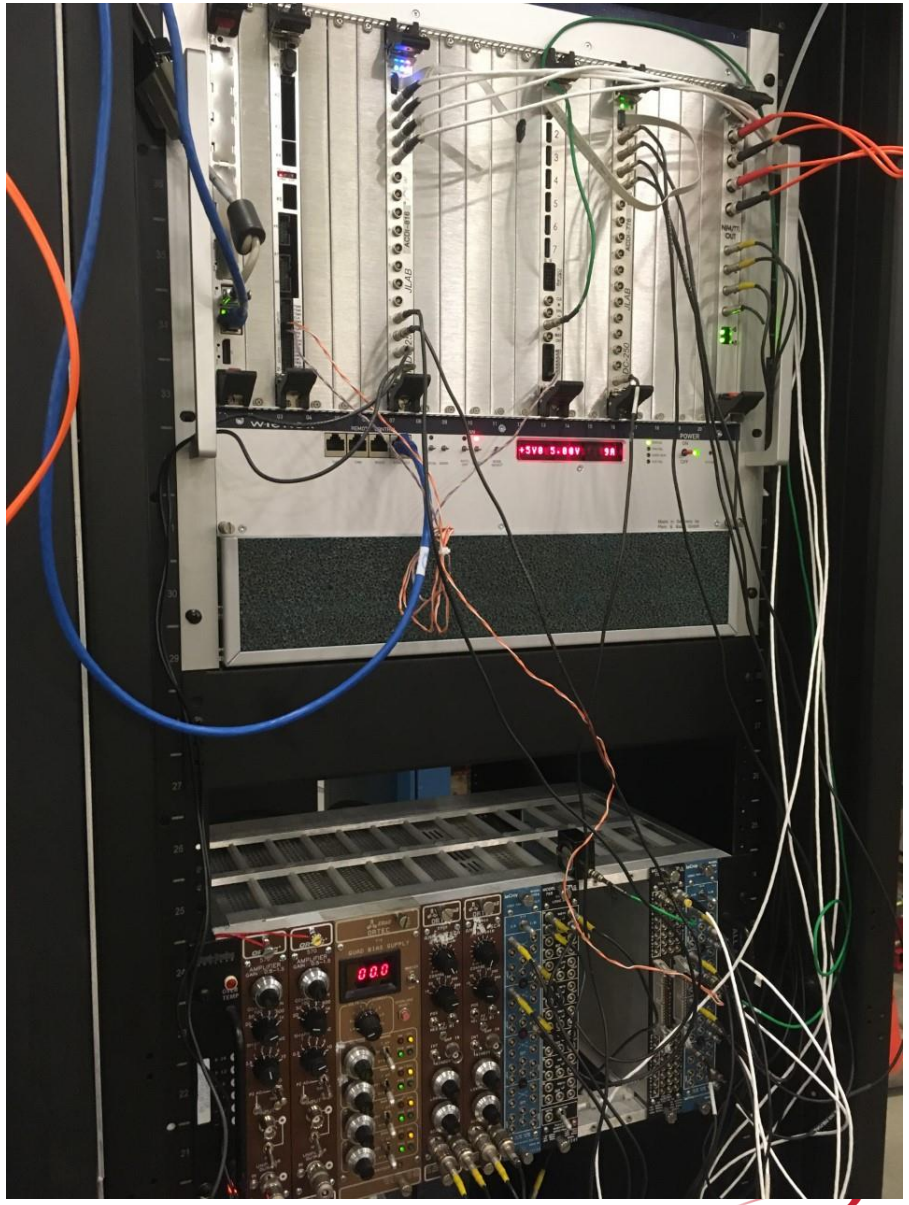


# DAQ Hardware

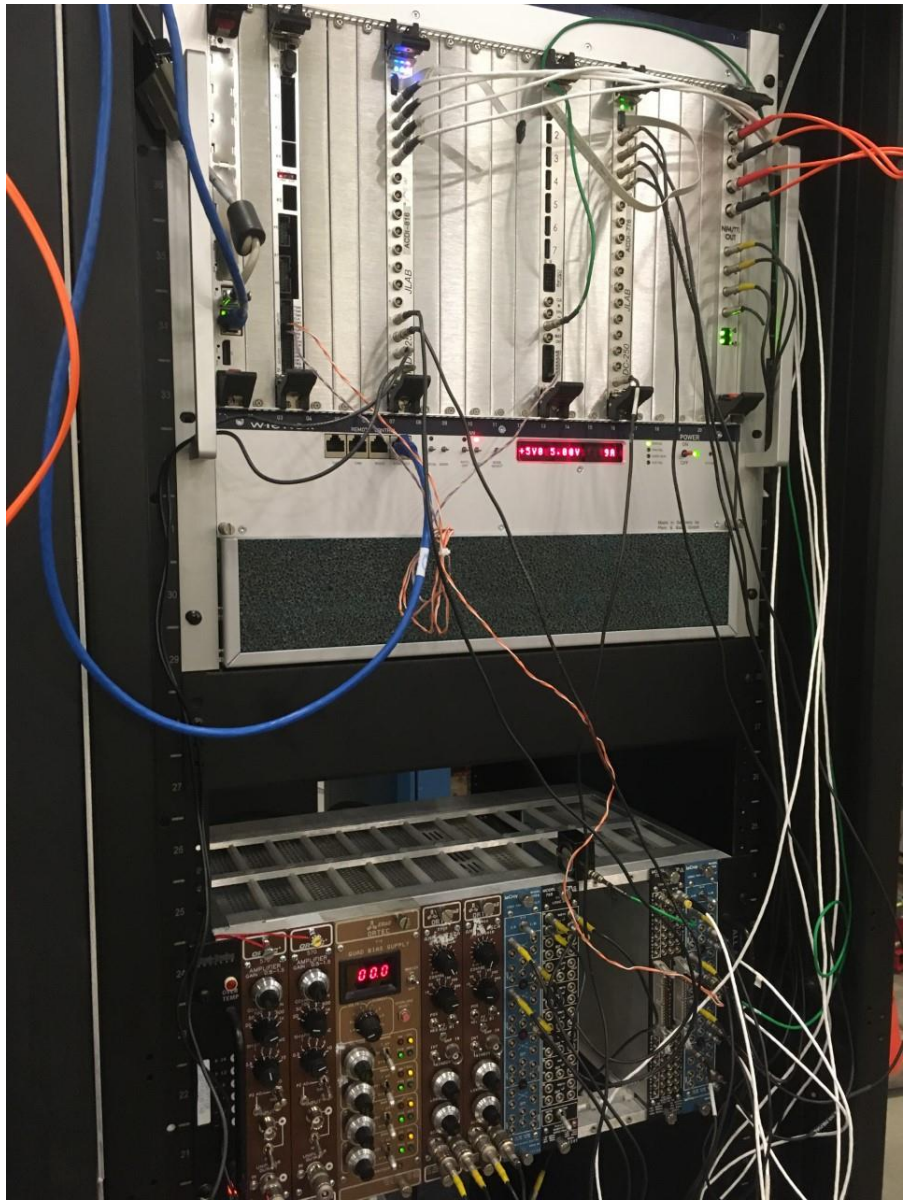
- VXS Crate and NIM Crate

- Mott detectors, Preamps, Amplifiers and Bias Supply

- Helicity signals from Helicity Board



# Mott DAQ

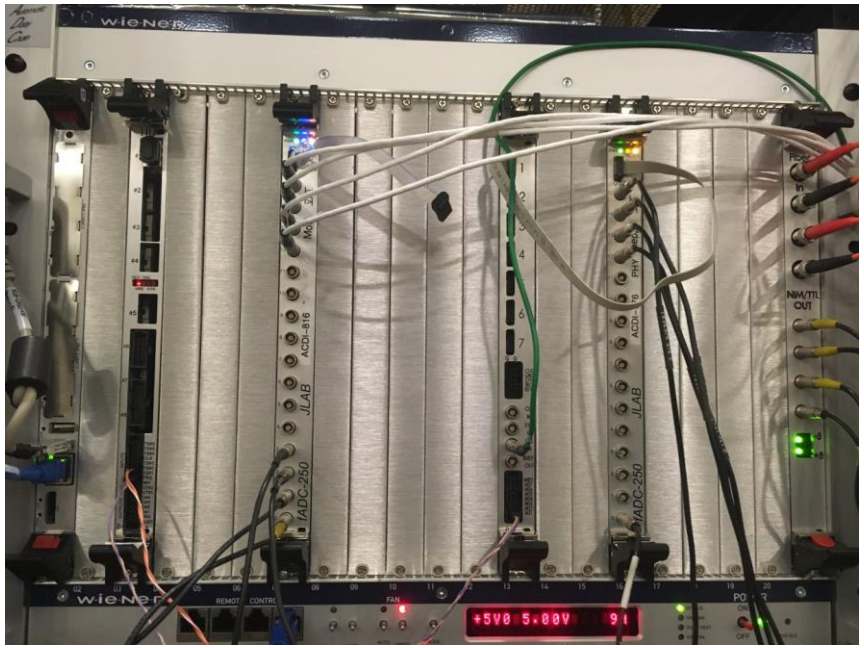


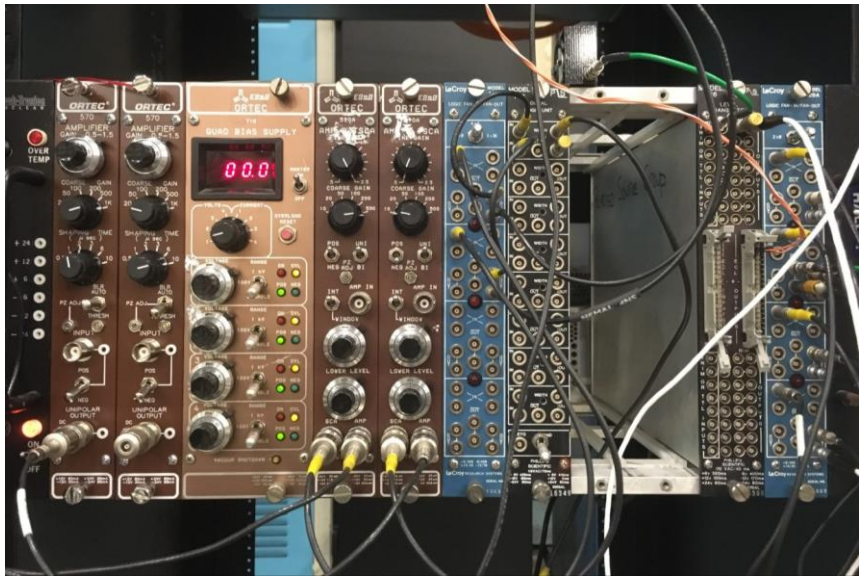
| Hardware | Rack |
|---|---|
| itfmdaq0 | ITF 07 |
| Mott VXS Crate | |
| Mott NIM Crate | |

# Mott DAQ crates

VXS Crate

| Slot | Board |
|---|---|
| 1 | Linux SBC |
| 2 | Empty |
| 3 | TID |
| 4 | Empty |
| 5 | Empty |
| 6 | Empty |
| 7 | Mott FADC |
| 8 | Empty |
| 9 | Empty |
| 10 | Empty |
| 11 | Empty |
| 12 | Empty |
| 13 | Distribution Board |
| 14 | Empty |
| 15 | Empty |
| 16 | INT FADC |
| 17 | Empty |
| 18 | Empty |
| 19 | Empty |
| 20 | Empty |
| 21 | FT |

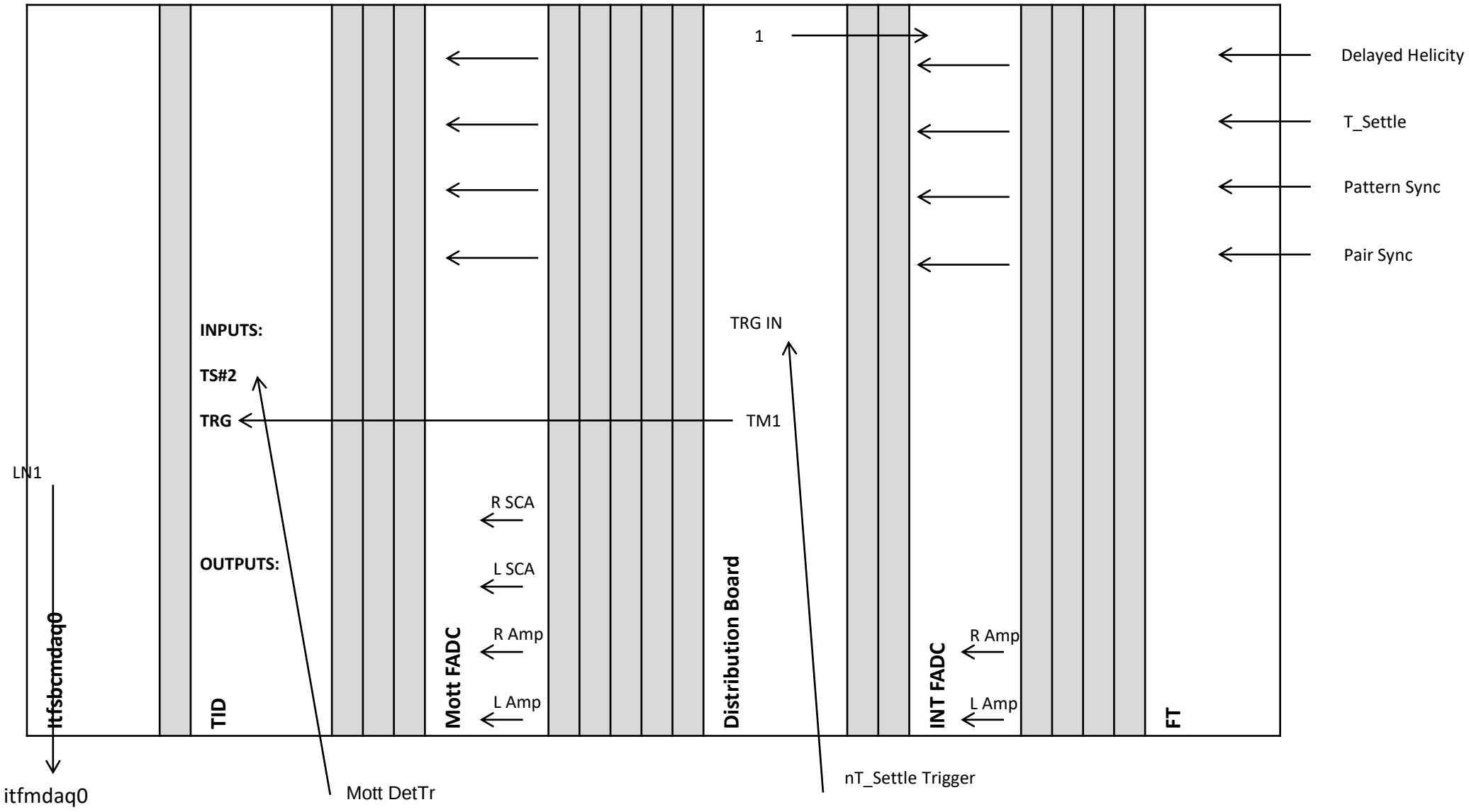



Mott NIM Crate

| Slot | Board |
|---|---|
| 1 | 570 Amplifier |
| 2 | 570 Amplifier |
| 3-4 | ORTEC QUAD BIAS SUPPLY |
| 5 | 590A Amplifier |
| 6 | 590A Amplifier |
| 7 | LOGIC FAN IN/OUT LeCroy 429A |
| 8 | Empty |
| 9 | Empty |
| 10 | Empty |
| 11 | LEVEL TRANSLATOR PS726 |
| 12 | LOGIC FAN IN/OUT LeCroy 429A |

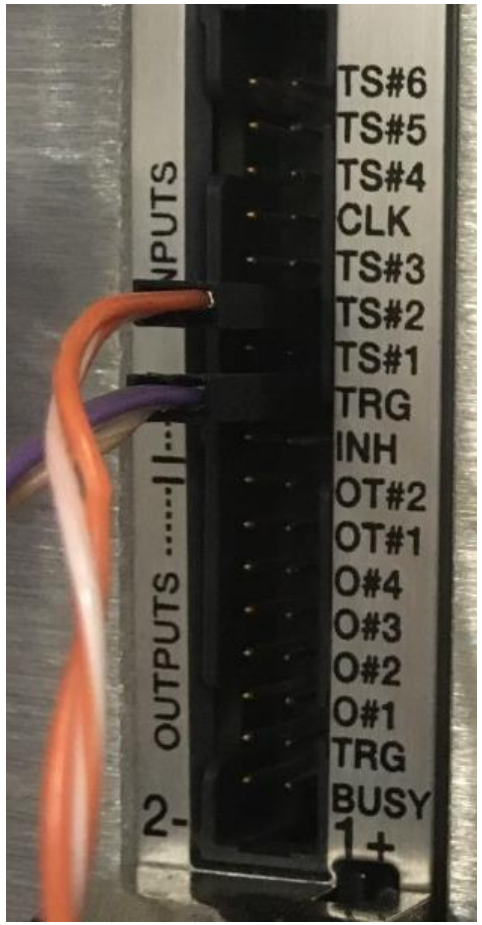
# VXS CRATE


1
Delayed Helicity
T_Settle
Pattern Sync
Pair Sync
INPUTS:
TS#2
TRG
TRG IN
TM1
LN1
R SCA
L SCA
OUTPUTS:
R Amp
L Amp
R Amp
L Amp
itfsbcmdaq0
TID
Mott FADC
Distribution Board
INT FADC
FT
itfmdaq0
Mott DetTr
nT_Settle Trigger

# Mott NIM Crate

| 570 Amp (50°) LEFT | 570 Amp (50°) RIGHT | ORTEC QUAD BIAS SUPPLY | 590A Amp (120°) LEFT | 590A Amp (120°) RIGHT | FAN 429A | LOGIC 758 | | | LT 726 | FAN 429A |
|---|---|---|---|---|---|---|---|---|---|---|
| → IN E<br>← OUT E | → IN E<br>← OUT E | 142A Preamp (120°) LEFT<br>**+115 V** | → IN E<br>← OUT E<br>← SCA | → IN E<br>← OUT E<br>← SCA | →SCA | →SCA<br>→SCA | | | → nT_Settle IN<br>← TTL/ECL OUT | → Delayed Helicity |
| | | 142A Preamp (120°) RIGHT<br>**+115 V** | | | →SCA | | | | | → T_Settle |
| | | 142B Preamp (50°) LEFT<br>**+115 V** | | | | | | | | → Pattern Sync |
| | | 142B Preamp (50°) RIGHT<br>**+115 V** | | | | | | | | → Pair Sync |

# CHANNEL ASSIGNMENT – TRIGGER INTERFACE (TID)




| TID Chan | INPUTS |
|---|---|
| 7 | |
| 6 | |
| 5 | |
| 4 | |
| 3 | |
| 2 | TS#2 (Mott DetTr) |
| 1 | |
| 0 | TRG (DB MT1) |
| INH | |

| TID Chan | OUTPUTS |
|---|---|
| 7 | |
| 6 | |
| 5 | |
| 4 | |
| 3 | |
| 2 | |
| 1 | |
| 0 | |

# CHANNEL ASSIGNMENT – PREAMPLIFIERS

| OUTPUTS | 142A Preamp (120°) LEFT |
|---|---|
| E | 590A Amp E IN |
| T OUT | - |

| OUTPUTS | 142A Preamp (120°) RIGHT |
|---|---|
| E | 590A Amp E IN |
| T OUT | - |

| OUTPUTS | 142B Preamp (50°) LEFT |
|---|---|
| E | 570 Amp E IN |
| T OUT | - |

| OUTPUTS | 142B Preamp (50°) RIGHT |
|---|---|
| E | 570 Amp E IN |
| T OUT | - |

# CHANNEL ASSIGNMENT – AMPLIFIERS

| Channel | 590A Amp (120°) LEFT |
|---|---|
| E IN | 142A Preamp E |
| E OUT | Mott FADC CH0 |
| SCA | Mott FADC CH2 |

| Channel | 570 Amp (50°) LEFT |
|---|---|
| E IN | 142B Preamp E |
| E OUT | INT FADC CH0 |
| SCA OUT | - |

| Channel | 590A Amp (120°) RIGHT |
|---|---|
| E IN | 142A Preamp E |
| E OUT | Mott FADC CH1 |
| SCA | Mott FADC CH3 |

| Channel | 570 Amp (50°) RIGHT |
|---|---|
| E IN | 142B Preamp E |
| E OUT | INTFADC CH1 |
| SCA OUT | - |

# FADC

## Mott

| FADC Chan | Signal |
|---|---|
| 1 | L EFT Amp |
| 2 | RIGHT Amp |
| 3 | LEFT SCA |
| 4 | RIGHT SCA |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | Delayed Helicity |
| 14 | T_Settle |
| 15 | Pattern–Sync |
| 16 | Pair–Sync |

## INT

| FADC Chan | Signal |
|---|---|
| 1 | LEFT Amp |
| 2 | RIGHT Amp |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | Delayed Helicity |
| 14 | T_Settle |
| 15 | Pattern–Sync |
| 16 | Pair–Sync |

# Mott NIM – QUAD FAN IN/OUT 429A

| QUAD FAN IN/OUT | | |
|---|---|---|
| | | **Delayed Helicity – IN** |
| | | INT FADC CH12 |
| | | Mott DADC CH12 |
| | | **T_Settle – IN** |
| | DB TRG IN | INT FADC CH13 |
| | 50 Ω | Mott DADC CH13 |
| | | **Pattern Sync – IN** |
| | | INT FADC CH14 |
| | | Mott DADC CH14 |
| | | **Pair Sync – IN** |
| | | INT FADC CH15 |
| | | Mott DADC CH15 |

# Mott NIM – LEVEL TRANSLATOR 726

| | LT | | | |
|---|---|---|---|---|
| | NIM IN | TTL/ECL OUT | NIM OUT | NIM OUT |
| 1 | Mott DetTr **(NOW a 10.13 kHz NIM Pulser)** | TID TS#2 | 50 Ω | SCOPE |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |

# Mott NIM – OCTAL LOGIC UNIT PS 758

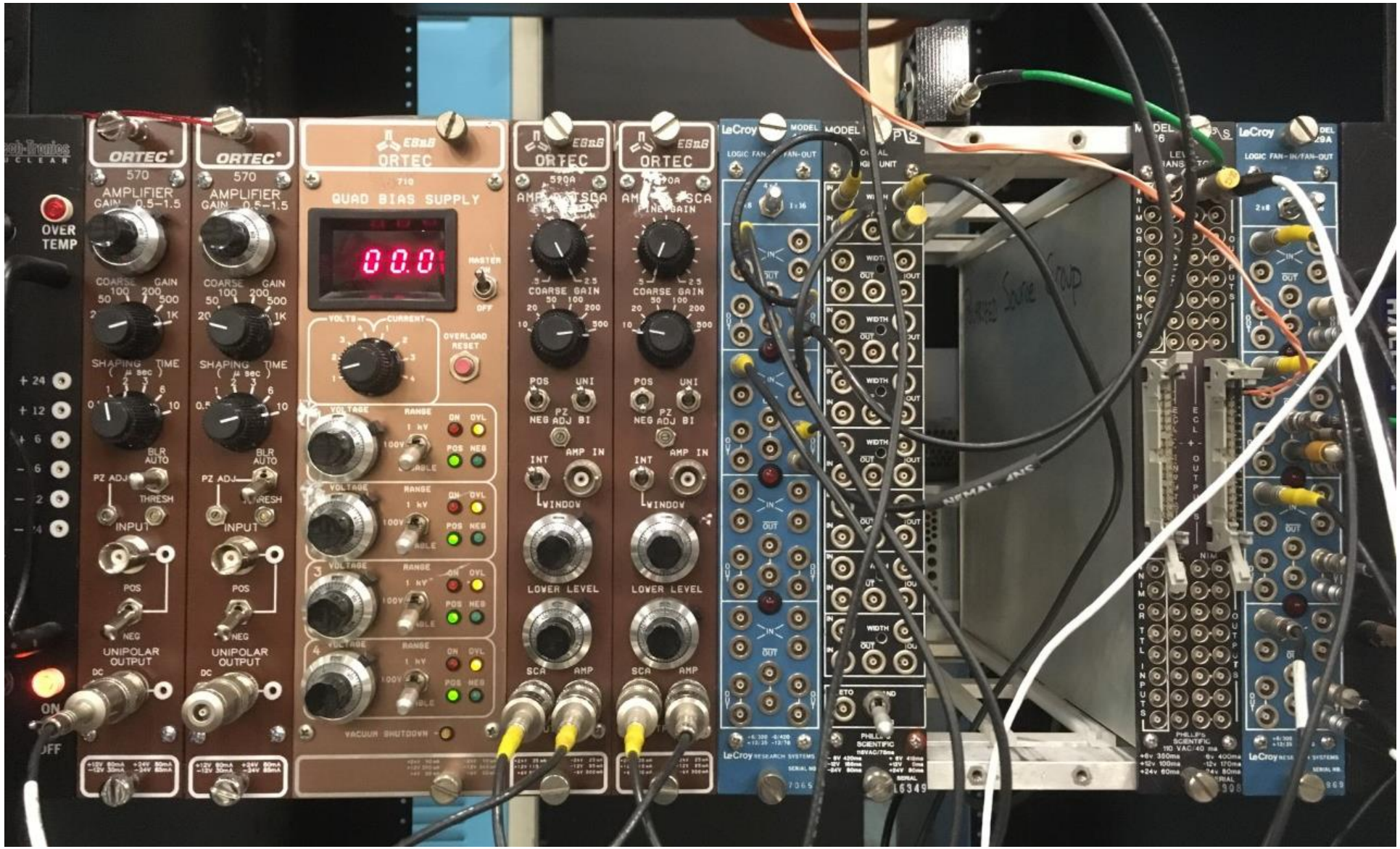
# Mott NIM – QUAD FAN IN/OUT 429A

| QUAD FAN IN/OUT | | |
|---|---|---|
| | | **LEFT SCA – IN** |
| | | OCTAL LOGIC UNIT |
| | | Mott DADC CH2 |
| | | **RIGHT SCA – IN** |
| | | OCTAL LOGIC UNIT |
| | | Mott DADC CH3 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

# Data Taking Modes

| Name | Readout | Output | Trigger |
|---|---|---|---|
| Mott_Sample | Mott FADC (Mode=1), INT FADC | Mott_Sample_%d.dat | Mott Detector |
| Mott_Int | INT FADC | Mott_Int_%d.dat | nT_Settle |

# VXS Crate

fADC-250
JLAB
ACDI-816
fADC-250
JLAB
ACDI-
PHY
Fiber
In
NIM/TTL
OUT
+5
+5
w-ie-Ne-r
REMOT
CONTRO
FAN
+5V0 5.00V 91
ON
OFF

# Mott NIM Crate