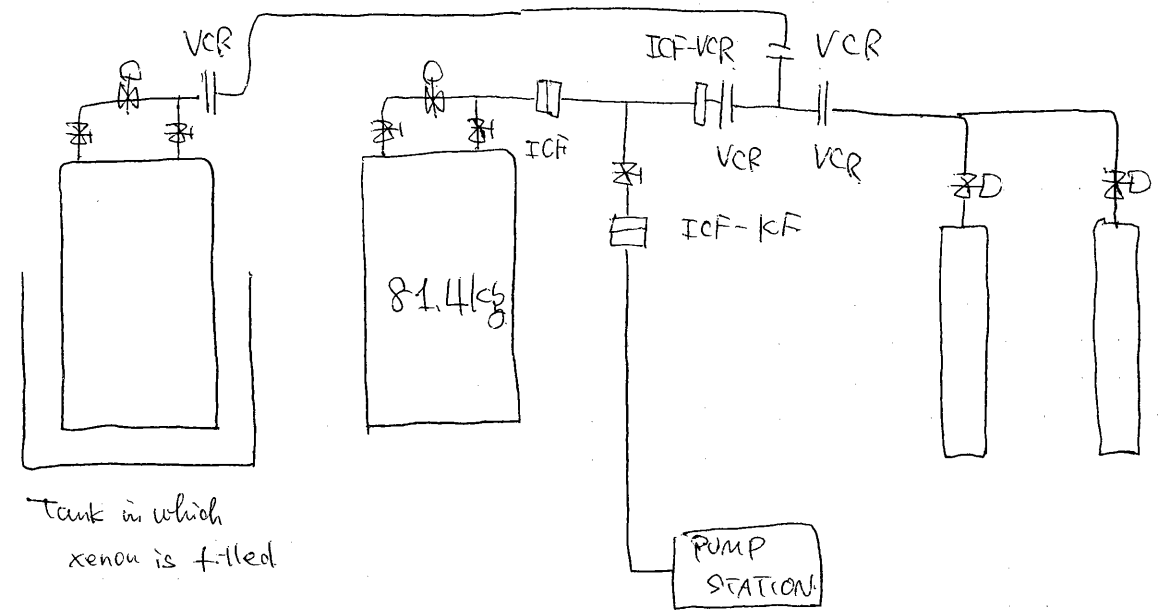


12/May/03.

Rebottling xenon.



19
21.08.2003

Check of the connection of the LP signal cables

Resistance measured at feed thru at the top flange

- #1 1-32 ch 100 kΩ OK
- #2 " " " "
- #3 " " " "
- #4 " " " "
- #5 1-20 ch 100 kΩ OK
- #6 1-32 ch 100 kΩ OK
- #7 1-~~16~~ ch 100 kΩ OK
- #8 6, 19, 21, 23 ch 10 kΩ OK
others 100 kΩ OK

⇒ total 228 ch OK.

21.08.2003

▷ Leakage test

Outer vessel $\leq 5 \times 10^{-8}$ mbar l/s OK

Inner vessel $\leq 6 \times 10^{-8}$ mbar l/s OK
w/o purification line

▷ 15:15 TMP for IV on @ 16 Pa

▷ 19:00 OV IV
 1.4×10^{-2} Pa 1.3×10^{-1} Pa

22.08.2003

▷ 8:00 3.4×10^{-3} Pa 5.4×10^{-2} Pa
14:40 2.5×10^{-3} Pa 4.1×10^{-2} Pa

18:20 HV module, PC LAN IP address setting

DAQ PC : 192.168.0.1
HV 1454 192.168.0.2
HV 1458 192.168.0.3

} These addresses are set in OVB and SC & tVedit are tested by applying OT for all channels ⇒ OK!

23.08.2003

18:15 OV 1.2×10^{-3} IV 2.6×10^{-2} Purification 4.2×10^{-1}

24/08/2003

HP data logger setup finished anyhow.

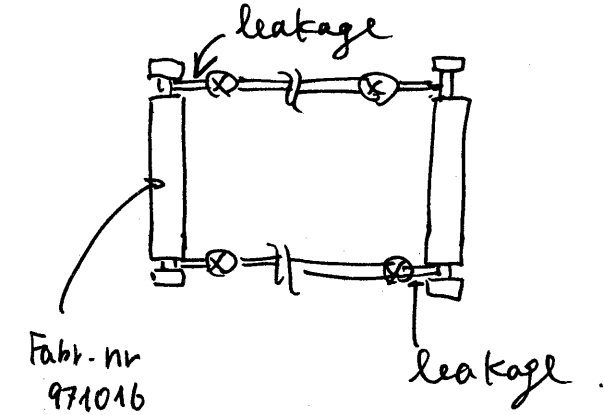
Still needs more careful check such as confirming all cable connections but anyway

the vacuum level can be monitored now.

The output of the vacuum gauge is in DC level.

For converting the level to vacuum level
 $P(\text{Pa}) = 10^{1.667 \cdot V(\text{mV}) - 9.333}$

▷ Large leakages found between Oxisorb and swagelok valve
⇒ swagelok valve should be kept closed
(Oxisorb is not used for the moment)



14:40 OV 8.9×10^{-4} IV 2.0×10^{-2} Puri. 4.3×10^{-4}

17:30 Several unstable Bundy connectors were fixed at the Patch Panel "Sg 6" 42, 25, 12, and 13.

25.08.2003

10:00 OV ~~8.8~~ 8.8×10^{-4} IV 2 ~~1.8~~ 1.8×10^{-4} Puri. 2.6×10^{-4}

ref.) vacuum level @ TERAS beam test
 OV 8.3×10^{-3}
 IV 2.0×10^{-2}
 Puri. 3.0×10^{-4}

18:00 Purification line leak test $\leq 1 \times 10^{-7}$ mbar l/s
 OK!

14:30 OV 6.4×10^{-4} Pa
 IV 1.6×10^{-2}
 Puri. 2.7×10^{-4}

19:30 Preparation for LED RUN

Electronics setting.

connect RUN control signal from SIS4100
 to appropriate places

SIS4100	OUT PUT	description
NIM	1	Reset flip-flop
NIM	2	Set Normal RUN
NIM	3	Set α RUN
NIM	4	Set COSMIC
TTL	4	PEDESTAL, LED RUN

SIS4100	INPUT	description
NIM	1	Event TRIGGER

PULSER output is supplied from TO the LED driver common IN.

27.08.2003

9:00 OV 5.5×10^{-4}
 IV 1.4×10^{-2}
 Puri. 2.2×10^{-4}

8:00 Evacuation of IV stopped for PMT check
 IV is filled with vapour gas from LN₂ vessel

27/08/03

15:25 Required Current for Devices.

COMPRESSOR	400V 3 phase	13.7A
VACUUM PUMP	230V	3A
	x 3	x 3 = 9A

Electronics	Total 9.2A	
FASTBUS	230V	1.6A
CAMAC	"	2.4A
NIM BIN	"	0.6A
		x 2 = 1.2A
FAN	"	0.24A
		x 5 = 1.2A
MACRO		
FAN-OUT	"	0.6A
		x 2 = 1.2A
HV	"	1A
(For both)		
PC	"	1A
(including Display)		

Getter purifier	230A	< 1A (in catalogue 3A)
-----------------	------	---------------------------

15:55 HV setting for 1×10^6 is loaded.

L4 HV error for L4 & B19

SWITCH OFF for these channels

16:55 # 5244 pedestal @ 1e6 setting
 # 5245 LED run @ 1e6 LED 1&5 without L4 & BT19.

29.8.2003
 HV data c: f online f hvdata f hvdata-27-Aug-2003 f 1e6-030827.dat

28.8.2003

15:45 # 5248 pedestal @ 1e6
 # 5249 LED run @ 1e6 LED 1&5

17:55 # 5250 pedestal @ 1e6
 18:00 # 5251 LED @ 1e6

~~No signal~~
 No ADC count in the following channels
 F14, T4, R15, BT19, L34, R37

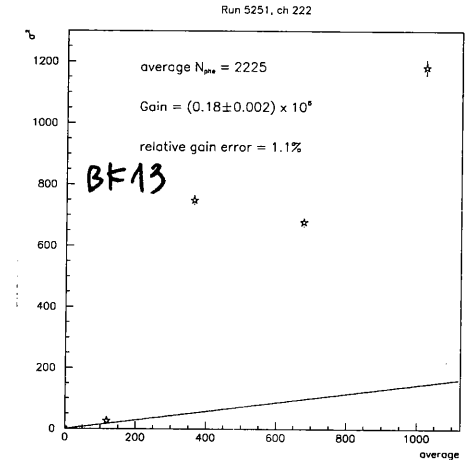
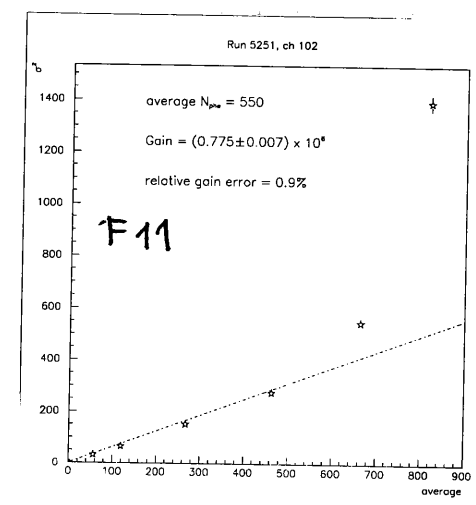
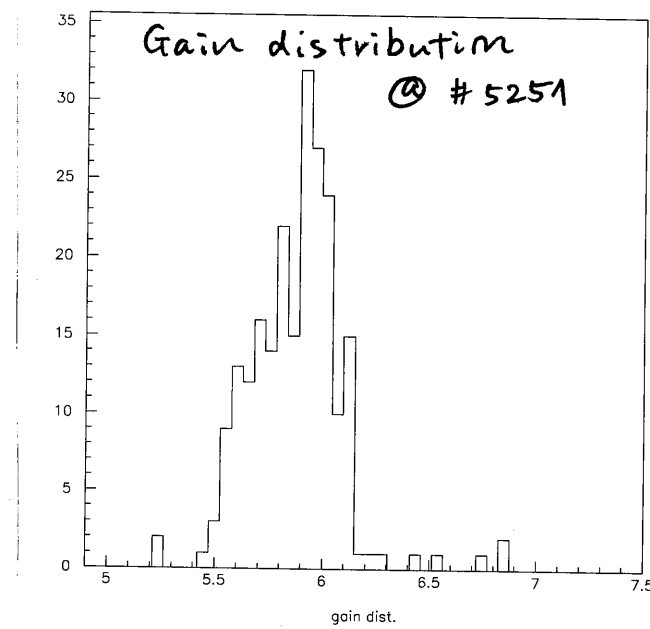
signal found in L4! \Rightarrow strange!

\downarrow HV not applied

lower card connector @ CIA slot 13 is shifted by one channel

Faulty channels @ LED ADC spectrum

	ADC #	Burndy	Feed thru
F14	31	X	O
BT0	39	O (low gain)	O (low gain)
L4	61	HV trip	$\rightarrow I = 90\mu A @ 100V$
F11	102	very low gain	very low gain
BT19	119	HV trip	$\rightarrow I = 70\mu A @ 100V$
T23	120	O (low gain)	O (low gain)
L34	165	X	X
R37	186	X	X



strange behaviour \Rightarrow in F11 & BF13

19:40 IV evacuation started

Summary of faulty channels as of 29.8.2003

L4	HV trip	(HV can be applied up to feed thru)
BT19	"	
L34	No signal	
R37	"	
F11	strange behaviour in calibration	
BF13	"	

F14 \Rightarrow cable bw/ Burndy & Feed thru seems broken (open)
 \Rightarrow broken ~~wire~~ wire @ card connector at top flange
 \Rightarrow Fixed.

31.8.2003

12:45

IV 1.9×10^{-2} Pa
OV 3.8×10^{-4}
Purification 1.3×10^{-4}

02/09/03

16:35

Pressurized Air Connection for the Getter
is ready at East Area Experimental hall.

03/09/03

14:40

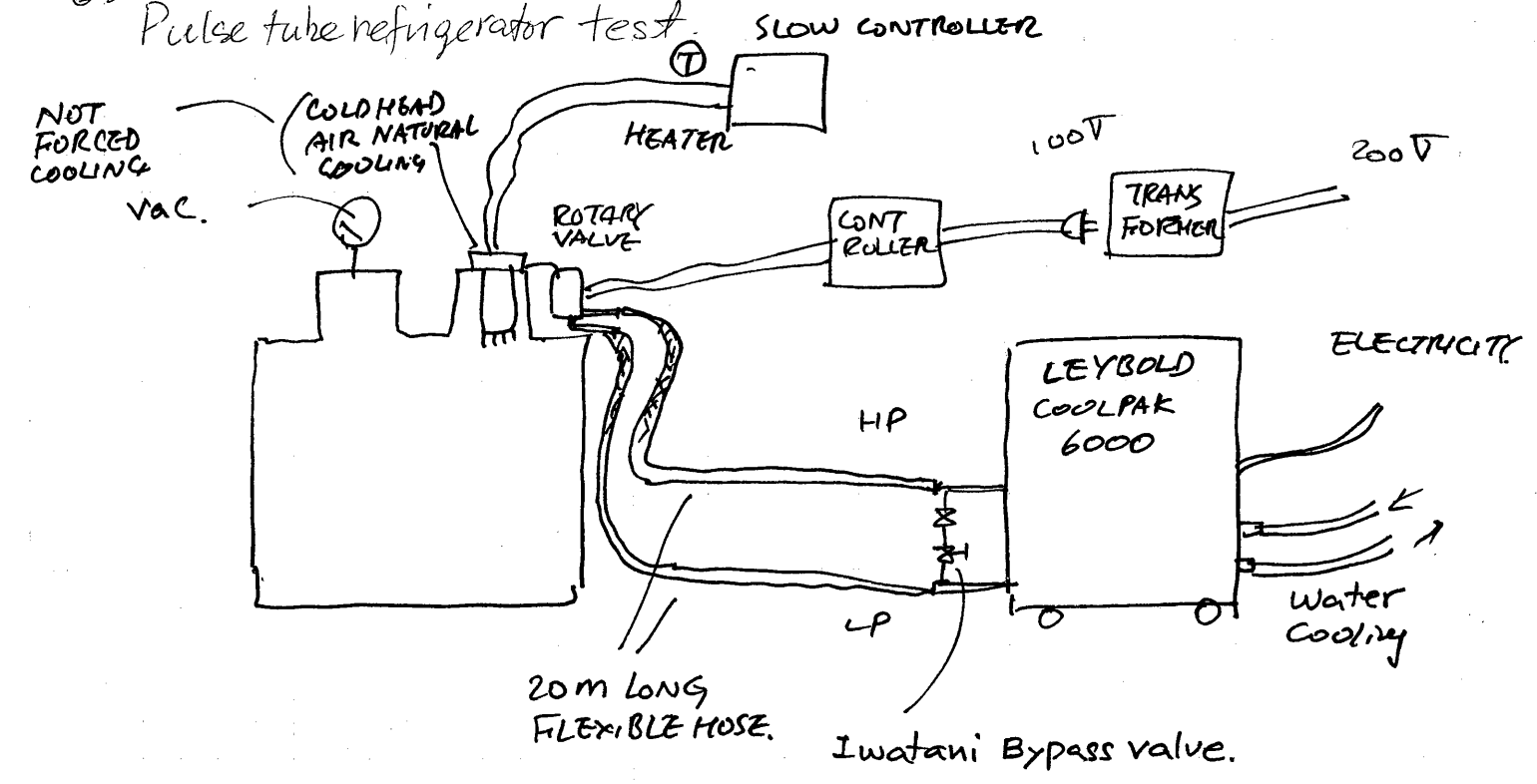
IV 9.6×10^{-3} Pa
OV 3.6×10^{-4}
PL 2.7×10^{-4}

PULSE TUBE

by T. HARUYAMA
K. KASAMI

18/09/03

Pulse tube refrigerator test.



LP: CONDITION
- INSIDE (Xe CHAMBER) VACUUM

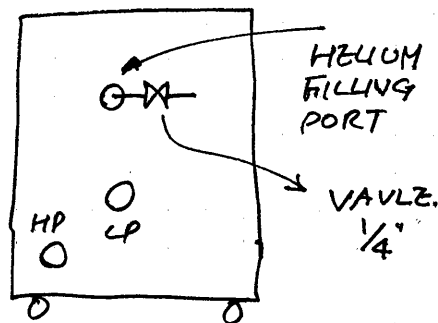
COMPRESSOR
- LEYBOLD.

	TCOLDHEAD	PHEATER	Pcomp. (High)	STATUS
14:00				
14:00				COMPRESSOR ONLY. TEST.
	(COOLING WATER IN. 1°C, 3.6 bar, OUT. 18°C, 3.4 bar) !			Pcomp 18 bar with Flexible Hose and Refrigerator
				- ROTARY VALVE CONNECTION → OK!
14:10				- Comp. MAIN SW. ON.
				- ON → P _{HP} 18 bar → 26 bar @ fully Bypassed.
14:25	Comp ON 296.5 K		P _{comp} 25 bar @ fully bypassed.	
14:30	241. K.			
14:33	206 K			
14:40				HEATER CONNECTION X. → CHECK.

DISCONNECTED
DUE TO NO CONNECTION
TO POWER METER
→ CONNECTED.

14:46 System trip: fail Oil cct. → Thermal switch (TSH2)
 → Releasing Helium gas.

LEYBOLDT COMPRESSOR



15:11 - HELIUM GAS FILLING PRESSURE
 18 bar → ~~16~~ 15 bar.

- ~~COLD HEAD CONNECTOR REPAIR.~~
 HEATER 135 Sv. at SLOW CONTROL INPUT

15:27 COMPRESSOR RESTART. BYPASS ON.
 15 bar. → 19.8 bar →
 147.6 K →

15:30 Oil cct. fail Comp stop.

16:00 ELECTRICITY ~ 230 V! → 400 V OK!

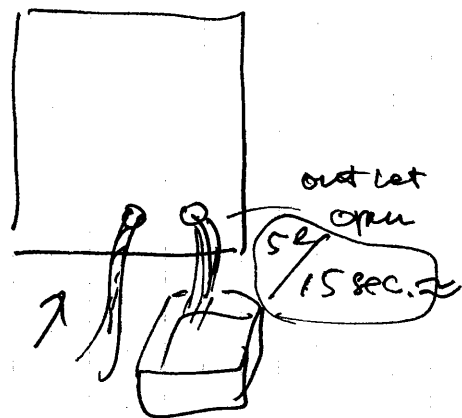
CHECKED with Stefan

16:14 Water in/out Temp check after turn on.

16:19 Comp off. Oil cct fail.

17:00 Cooling Water check.

Water pressure
 Line IN 3.8 bar
 Line OUT 3.5 bar) $\Delta P \approx 0.3$ bar



17:23 Comp ON. PTR operation

→ Bypass → ~~close~~ closing. $T_c = 177.5$ K

Comp. Failure! SAME REASON

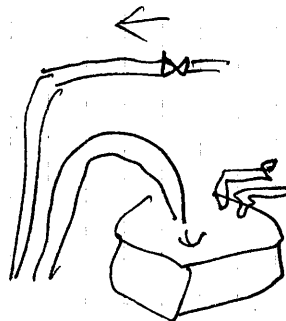
17:44 COOLING LINE RETURN → DIRECTLY TO BASIN
 TO GET ENOUGH $\Delta P \approx 3.8$ bar.

17:47 COMP ON.

$\rightarrow \approx 5$ l/min

17:50 Oil cct fail. comp off
 → 133 K.

SAME HOT



18:33 Bypass removed.

Comp ON.

Pressure release 24 bar → 22 bar.

Cooling water outlet open. flow rate $6 \frac{L}{30 \text{ sec}} = \frac{12 L}{\text{min}}$

* HEATER 100% @ 120 K → $T_{\text{set}} \rightarrow 100$ K Stop HEATER

18:47 Comp off OK!

Water outlet → ~~TO~~ RETURN LINE. $T_c = 112$ K.

19:01 Comp ON $T_c = 171$ K, $T_{\text{set}} = 165$ K

$P_{\text{IN}} = 15$ bar

$P_{\text{HIGH}} = 23$ bar

19:05 $P_{\text{HIGH}} = 22.2$ bar $T_c = 153$ K

19:10 $P_{\text{HIGH}} = 22.1$ bar $T_c = 145.8$ K

19:15 $P_{\text{HIGH}} = 22.1$ bar $T_c = 144$ K

NO Bypass

19:20 $P_{\text{H}} = 22.1$ bar. $T_c = 143.6$ K

19:22 Stop. Comp OK!

Bypass line → SETUP. VALVE 100% CLOSE

19:30 Comp ON. $T_c = 172$ K.

19:30 $P_{\text{HIGH}} = 22.5 \sim 23$ bar.

19:35 $P_{\text{HIGH}} = 22.2$ $T_c = 149$ K

19:40 $P_{\text{HIGH}} = 22.2$ $T_c = 146.5$ K

19:45 ~ 22.1 $T_c = 145.7$ K

19:46 Bypass open. NEEDLE 21 bar DIAL. 5 145.7 K

19:50 FEEL TEMP GETTING HOT.

19:50 Bypass close again. → 22.1 bar

19:57 ~~Bypass open again.~~ $T_c = 146.2$ K

20:00 21.1 bar 147.7 K. 100% HEATER

At thermometer at TSH2.

20:13 At $T = 120.2$ mT

20:14 Bypass open to → 20. bar NEEDLE ~ 8 148.6 K

20:20 122.1 mT, 150 K. 20 bar.

20:21 Bypass open to → 19 bar → Temp up. 124 mT ~
 CLICK NOISE DISAPPEAR.

20:24 Bypass close to 20 bar → Temp down! 132. K. const.

20:26 Bypass full close. → 20. → 22.1 bar
 Pressure release. Pt Temp ⇒ 120.00 mV Ω.

20:33 151 K.

20:33 Pressure release. 22.1 bar → 21. bar.

20:38 Tc = 153 K
 Pt = 119.6 Ω, P = 21 bar

20:45 Tc = 154 K
 Pt = 119.5 Ω, P = 21 bar

Pressure release. → 21 bar → 20 bar

20:50 Tc = 156.4 K
 Pt = 119.1 Ω, P = 20 bar

20:56 Tc = 158.0 K
 Pt = 119.1 Ω
 Pressure release → 20 → 19 bar

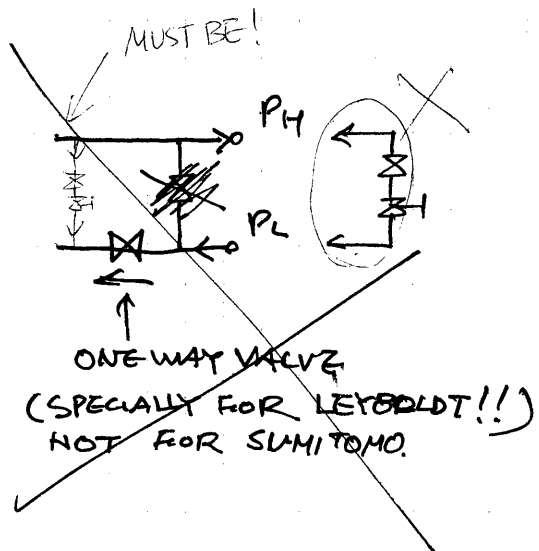
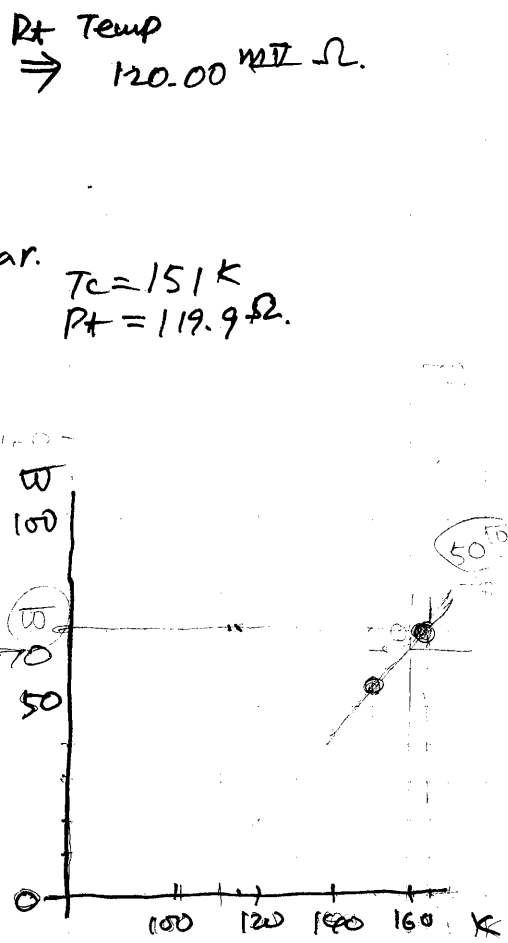
21:05 Tc = 161.35 K
 Pt = 118.56 Ω
 P = 19 bar.

21:10 Tc = 162.0 K
 Pt = 118.53 Ω
 P = 19 bar.

21:10 Tset = 150 K

21:15 Tc = 149.2 K, Tset 150
 Pt = 118.7 Ω, P = 19 bar

21:18 Tset → 100 K
 Psteady = 12.5 bar



CLEARLY UNDERSTOOD:

- BYPASS OPEN ⇒ TSH2 TEMP INCREASE!!

TOMMOROW:

- TEST AGAIN. ~~W~~ WITHOUT BYPASS.
- COVER CLOSE.

9/19.

- CONTACT WITH IWATANI.

- TOO MUCH BYPASS CAUSED LESS ΔP IN THE COMPRESSOR
 → NO SUFFICIENT OIL FLOW.
 → TEMPERATURE HIGH ALARM!

- NEED TO KNOW THE 'RECOMMENDED' ΔP BY LEIBOLDT.

9:17 P = 11.3 Bar! TEMPERATURE CHANGE?

10:58.

① BYPASS VALVE → ~~SERIES~~ SERIES.

- CHARGING 14 bar.
- ~~BYPASS~~
- P = 11.3 bar. RUN.
- Full open.

Tc = 293 K.

- HEATER / Tset = 165 K.

11:09 Comp ON.

P_{high} = 18.8 bar / 11.3 bar Filling.

11:12. 264.4 K.

11:14 232.7 K

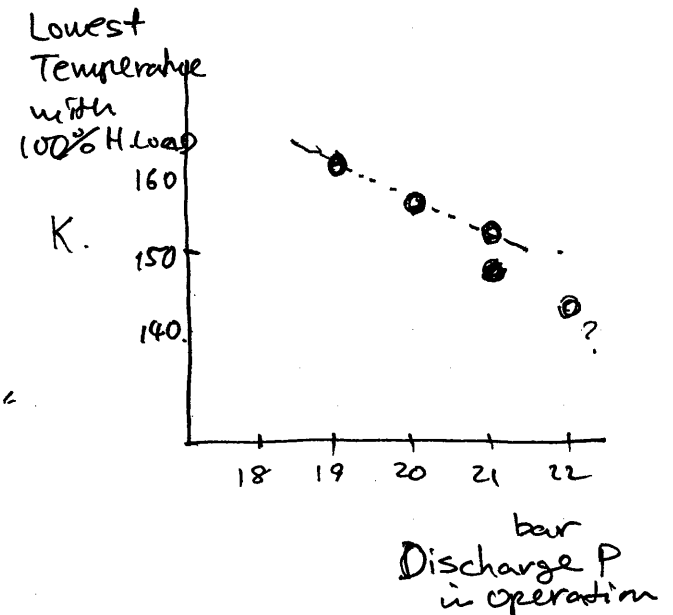
11:17 197.8 K

11:20 170 K

11:22 153.8 K HEATER FULL 100%!

11:25 137 K Pt 59.3 °C - 6.6 °C

11:28 118.4 K Comp off.



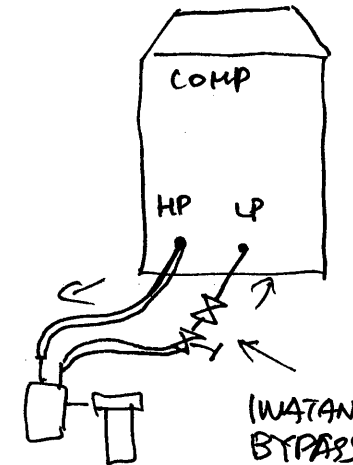
COOLPAK 6000.

COMP DESIGN PRESSURE

23.6 / 8.9 bar
 (2.36) (0.89) MPa

CHARGE.
 15 bar
 (1.5 MPa)

50Hz 400V 3φ
 13.7A 8.2 kW
 - START UP.



COLD HEAD AIR COOLED.

Pt value
 PT — 6.6 °C = REAL

CIRCULATION RATE

14:20 Restart. Pres. = 11.2 bar. Tc = 207.4
HEATER Tset = 165 K

14:22 P = 18.0 bar, Tc = 196 K HEATER = 0!

14:26 Tc = 166.2 K

14:32 P = 17.0 bar Tc = 125 K

TPT 60.1°C - 6.6°C =

Low Pressure Line Monitor?

14:37 107 K 100% HEATER
Tset 165K → 100K

14:39 Tset 100 → 95 K

14:42 HEATER DISCONNECTED!
CONNECT.

P_{low} = 3 bar
P_{high} = 16 bar
90 K
22%

14:45 Tset → 120
Tset = 62.0°C - 6.6°C

14:55 Tset = 120 K, Q = 53%
P_T 61.6°C - 6.6°C (37W)

14:57 Tset = 150 K.
15:02 Tc = 134 K Q = 100%
P_T = 61.4°C - 6.6

15:17 Tc = 150.3 K Q = 85% (59W)
P_T = 60.9°C - 6.6°C

15:20 Tset = 160 K.

15:44 Tset = 160 K Q = 95% (63W)
P_T = 62.2°C

Valve close

15:54 Tset = 160 K Q = 86% (58W)
P_T = 60.6°C

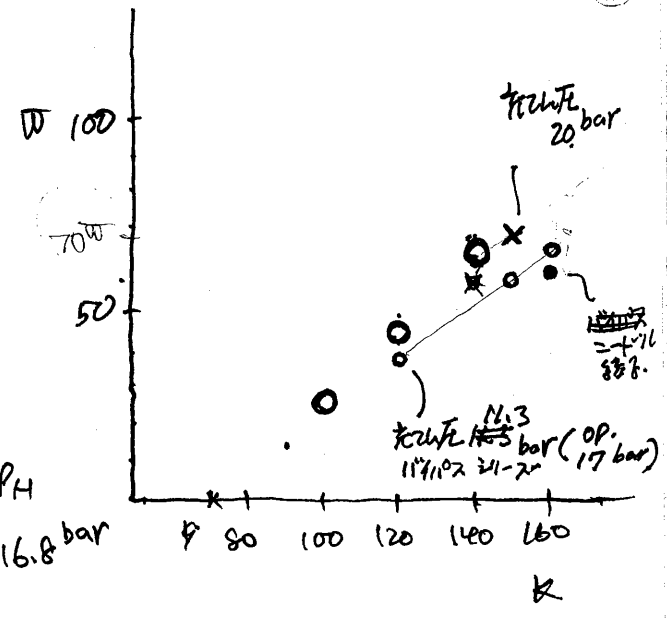
16:00 He charge to 20 bar in operation
160 K Q = 95% → 100%

16:06 157 K Q = 100% P_T = 63.9°C P_L 3.0 bar 20 bar

Purification Circulation 8 1/2 min

480% h. ≈ 1 1/4 UQ
≈ 100 W.

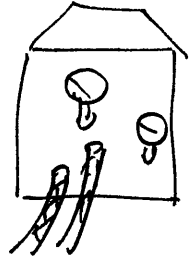
150 W + 20 W



16:20 Tc = 152 K Q = 100% 64.4°C P_L 3.1 bar P_H 20 bar.

16:21 Comp Stop

16:42 - CHARGE 14 bar
- NO BYPASS.



16:48 Tc = 162.2 K. P_T = 48.8°C
Comp start.

16:50. P_L P_H

16:53 Tc 133.8 K Q 0% TPT 70.5°C - 6.6 P_L 5 bar P_H 23 bar

16:56 118.1 K 0% 71.2 5.1 bar 22 bar
17:00 101.9 K 0% 73.1 5.4 bar 22 bar

17:18 100 K 34% (24W) 73.8 5.4 22 bar
Tset 100K → 120K

17:35 120 K 61% (43W) 73.6 5.2 22 bar

17:47 Tset 140 K

18:05 140 K 90% (63W) 72.9 4.8 22.5

18:08 Release gas pressure. 22 → 21 bar
140 K 85% 4.7 22.0

18:14 Comp STOP. HEATER ON Tset = 273 K.

REFRIGERATOR WARM UP TO RT.

18:31 HEATER OFF Tset = 140 K.
COMP START.

filling P_{high} 15.8 bar / P_T 46°C

18:33 273 K
18:35 225 K 70.2°C 4.5 bar 22.5 bar

18:37 192 K 70.7°C
18:39 168 K 71.3°C

18:41 150 K 71.9 4.7 22.0 bar
18:43 135 K 72.5 4.9 22.0 bar

19:05 140 K 95% (67W) 72.5

19:10 He release to 22 bar → 20 bar.

19:15 140.3 K 80% 70.4°C 4 bar 20 bar
19:16 Comp off. He charge to 22 in operation Comp off

19:22 He has charge to 23.5 in operation.

19:24 $T_c = 139.4 K$ $Q = 100 W$

19:26 He gas release to 22 bar in operation

19:28 Comp off //

冷凍機が22 barに7.5 (6 barを大きく余裕に冷凍能力があると思込られた場合)

① ON-OFFにしようとしたら、

・信号(1) LP He 内圧 → 設定値をこえたら、圧縮機 ON. 下がれば OFF (注) 40%以上を防止すること (不凍帯など)

設定は LN 電圧弁を10-11 bar の内側に設定 (通常は圧縮機が ON-OFF で 電圧弁 LN ON-OFF)

・信号(2) 温度計 → 従来のまま

②

2003-9/29 冷凍機調整

13:52 運転前圧縮機圧ヤ計

15.5 bar

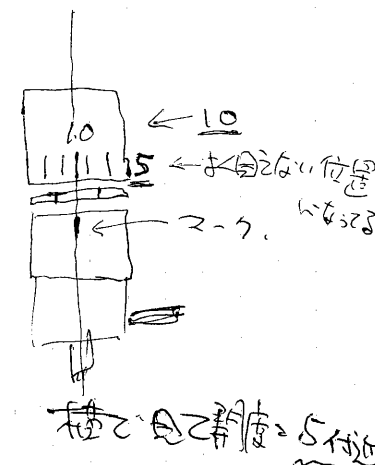
・冷却水 入水側 12-11

3.75 bar 1°C
3.50 bar 2°C

・He 出口圧縮機温度計

30.1°C

13:59 圧縮機 → ON



Subject: 冷凍機調整

From: TomHaruyama@aol.com

Date: Mon, 22 Sep 2003 05:34:30 EDT

To: katsuyu.kasami@kek.jp, satoshi.mihara@psi.ch

笠見様

ようやくコロンビア大が済み、アラスカです。今週は忙しいと思いますが、月曜日の初めにでも以下のことをチェック願います。

[チェック内容]: パルス管のオリフィス開度による影響をしらべる

0) 現状のオリフィス弁開度をしっかり記録 (ニードル開度は微開で ~5 付近) --- OK

1) まず現状のまま、圧縮機をうごかす

13:59

2) ヒーターがかかるようにヒーター出力差込プラグを確認 (澤田君に) --- OK

3) 温度設定を 140K にする --- OK

14:50

4) 冷却が進み、140K で定常になるのを待つ (記録)

14:58

5) 定常になったら、ニードル弁をより開いて 7.5 程度にする

15:30

6) しばらくして落ち着いたときの冷凍機先端温度 (T_c) を記録 --- 15:30

7) 4) の時より温度が下がっていたら開度を 10 にする (10 は 1 回転です) --- 15:35 やり直し

8) 4) の時より温度が上がっていたら開度を 3 にする

つまりニードルの開度を変えてより低い温度が取れるかどうか確認していただきたいのです。よろしく願います。大まかな傾向がわかり、やはり現状で一番低温が取れるようであればオリフィスの問題でなくなります。

現状でも液を保持することはできますので、最後は現状の開度でエリアに移す作業に移っていただいて結構ですが、結果は早くお知らせください。よろしく願います。

	T_c	Q	T_{PT}	PL	PH
14:50	139.72 K	92.24%	67.2°C	0.45~0.50 MPa	22 bar
14:50	140K 一定				

14:58 ニードル弁をより開いて 5.0 → 7.5

	T_c	Q	T_{PT}	PL	PH
15:30	139.92 K	52~62%	67.9°C	0.46~0.51 MPa	22 bar

15:35 ニードル弁を定常より +1 回転

15:43 T_c 温度 17.5 K まで上昇
↓
定常値の 5 回転に合わせる

16:15 定常 5 → 8 の時

139.2 K	50%	68°C	0.46~0.51 MPa	22 bar	⑤ 16:16
---------	-----	------	---------------	--------	---------

16=20 11"開度を8 → 7 (+2)

16=30 140.25K 67~72% 68°C 0.46~0.5MPa 22bar.

16=33 11"調整 7 → 6 (+1)

16=44 140.25K 79~86% 68°C 0.44~0.48MPa 22bar

16=47 11"調整 6 → 5.5 (+0.5)

17=00 140.00K 79~86% 68°C 0.44~0.48MPa 22bar.

17=02 11"調整 5.5 → 5.0 (電圧の位置).

17=12 140.2K 85~92% 67.5°C 0.43~0.47MPa 22bar.

17=16 11"調整 5.0 → 4.0 (-1回転).

17=26 140.2K 85~93% 67°C 0.43~0.47MPa 22bar.

17=~~26~~³⁰ 11"調整 4.0 → 3.0 (-2回転). 能力低下.

17=~~26~~³³ 11"調整 3.0 → 5.0 (電圧の位置)

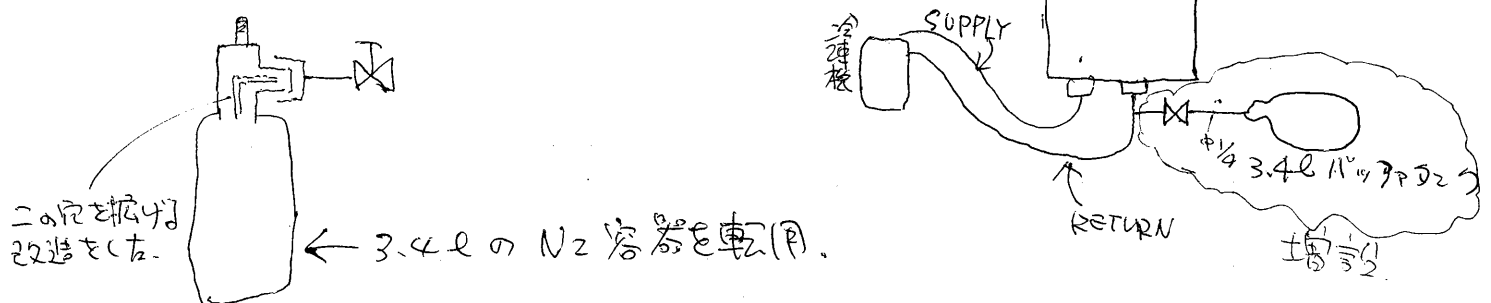
17=45 140.2K 80~88% 67.4°C 0.43~0.47MPa 22bar

17=46 コールドヘッド用 空冷~~機~~ 取付. 運転開始.

18=05 140.32K 89~95% 67.4°C 0.43~0.47MPa 22bar

18=50 停止. 11"開度="5" 最大能力位置.
 電圧の位置を調整.

2003-9/23 11"調整の増設について



容器の真空引 → He → 真空引 → He → 真空引 → He → 取付.
 温度 電圧 電圧 電圧 電圧
 16=~~20~~⁴⁰ 295.2K 0% 26°C 22bar.
 起針

17=30 137.2K 100% 65°C 0.53~0.58MPa 22.5 bar

17=43 2-11"ヘッド(7) 空冷機を運転

17=45 137.8K 100% 66°C 0.53~0.58MPa 22.5 bar

17=56 2-11"ヘッドの空冷機を運転すると、電圧は温度が下がる。

18=00 136.1K 100% 67°C 0.53~0.58MPa 22.5 bar.

18=20 135~135.7K 100% 66.7°C 0.53~0.58MPa 22.5 bar.

18=12 136.1K 100% 66°C 0.53~0.58MPa 22.5 bar.

20=00 136.5K 100% 66°C 0.53~0.58MPa 22.5 bar

20=01 増設した電圧を閉 → 閉 ... 様子を見る

21=05 運転停止.

2003-9/24

8:50 冷却水 行 3.75 bar 温度 1°C
 帰 3.40 bar " 5°C
 772 空冷 OFF → OK

8:56 運転前
 289.3K 0% 25.7°C 14 bar

10:10 ST = 120K
 120K 81.7% 66°C 0.52~0.57 MPa 22.5 bar

10:20 120.7K 81.7% 66°C " "

10:22 ST = 120K → 100K

10:45 99.9K 49% 67°C 0.55~0.6 MPa 22.3 ~~MPa~~ bar

10:56 99.0K 49.9% 67°C 0.55~0.6 MPa 22.3 bar

11:17 99.2K 49.2% 68.1°C " "

11:17-927 (閉)

10:20 11:17-927 の元弁 閉 → 閉 ST = 100K

10:40 99.9K 47.6% 68°C 0.55~0.6 MPa 22.3 bar ← (100K)

10:50 ST = 100K → (120K)

12:00 120K 80.7% 68°C " "

12:15 120K 76.8% 68.4°C 0.52 MPa ~ 0.57 MPa 22.5 bar

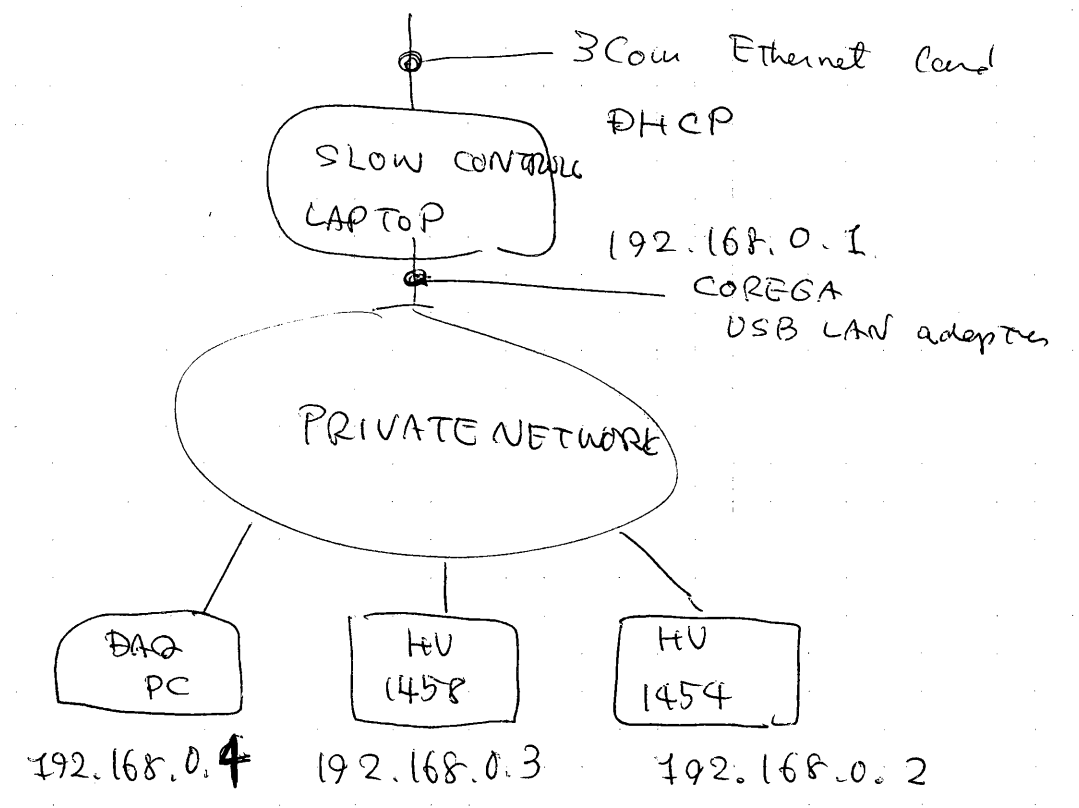
12:18 ST = 120K → 140K

13:03 135K 100% 67.8°C " "

13:20 135K 100% 68°C " "

13:35 停止

For setting static addresses for the HV power suppliers, a private network is configured in the barrak.



18:25 SaTochi
 18:30 P.S. 2.1×10^{-4} Pa
 18:40 baking out Xe transfer line start @ 60V
 20:35 Finish provisional beam time as mentioned verbally.

Actual Settings -- Sat Sep 27 20:35:18 2003

Device	DAC	ADC	Scaling
QTH51	1372	0.3316	1.0
QTH52	-729	-0.1748	1.0
QTH53	0	0.0002	1.0
ASZ51	-2904	-0.2127	0.3
QTB51	721	0.1744	1.0
QTB52	-706	-0.1692	1.0
ASY51	-702	-0.1683	1.0
QSL51	-330	-0.0823	1.0
QSL52	837	0.2042	1.0
ASL51	-12280	-0.1841	1.0
QSL53	-523	-0.1272	1.0
QSL54	813	0.1956	1.0
SSL51	0	0.0000	1.0
SSK51	0	0.0000	1.0
FSH51	230	0.2757	4.1
FSH52	230	0.2291	4.1
DSC51	0	0.0598	4.1
DSC52	370	0.3636	4.1
FS53-O	380	0.3819	4.1
FS53-U	380	0.3814	4.1
FS53-L	250	0.2491	4.1
FS53-R	250	0.2491	4.1

Beam Setting file:
Meg-117.set

This is the tune for
117 MeV/c π^- up to
the intermediate degrader
in ASY51 then rest of
beam line is set for
113 MeV/c π^-

however these settings were
for a longer beam line with
extra elements in the area
where the e^-/π^- separation
occurred further downstream
than now. So I don't
know how well the e^-/π^-
are separated @ the
Pb-Collimator
wall

The profile is ~ as expected @ this location with a horizontally layer spot.

- Things to do before I do the proper beam tuning
(i) We need a new bottle of 80% Ar: 20% CO₂ ask Konrad Dieters if he has another bottle or can he order another one
DONE 29.9.03

(ii) Air conditioning needs to be checked the new fixed air conditioner doesn't work properly - ask Haldenbeck to get someone to look @ it - otherwise we can borrow mobile unit from Hr. Heinz STANEK tel 2835
DONE 30.9.03

(iii) the accelerator signal cables outside barrack should be brought into barrack if possible. **28.9.03 Done**

(iv) also Scanner cables that are in zone need to be placed inside barrack. **28.9.03 Done**

(v) Remember beam Counter must be fan-out via X10 amp. So that I can setup separate electronics rack with this signal ~~also~~ without change trigger discriminators threshold - also proton signal & RF have to go via discriminators as I need these signals too.

IMPORTANT! (vi) Ask Konrad Dieters whether it is normal that slit FSH51 is set @ 270 and seemingly stuck
Konrad (29.9.03 10:00): Known problem, nothing to do about it.

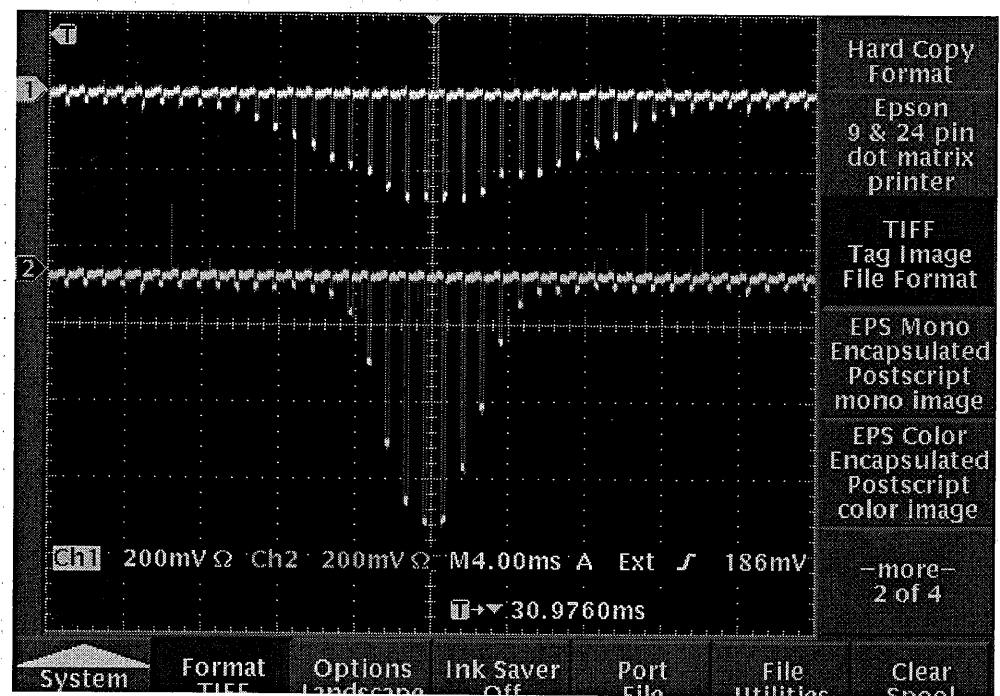
Also the Collimator wall is currently positioned at 1505 mm with a presently (40x40) mm² aperture - it is centered on the beam line

- Counter S1 is also mounted @ the correct ht, mounted to one side @ present in order to stop the π^- s in the target with the 117 MeV/c // need ~ 29 mm C degrader ($\rho = 1.75 \text{ g cm}^{-3}$) I have Shawn Watarn / Sabarhi when the degrader is

!!!

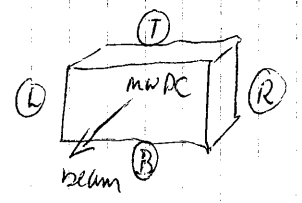
(L) FWHM ~ 2cm

(B) FWHM ~ 1cm



(R) Horizontal PROFILE

(T) Vertical PROFILE



Should be TC be covered
with window counter

I abandon ship I will be back 1 week this coming Monday
 good luck !!!

28 - Sep - 2003

09:30 The accelerator signal cables are in the barrack.
 The cables runs from the TTE1 control room, through
 the patch panel, to the area, and then to the barrack.

The labels are: DISPLAY - beam status display -
50MHz - machine frequency (660 mV pk-to-pk sine wave,
 with ~10% baseline noise! ATTENTION when
 using it for timing)

MHC - proton beam intensity

2u Opt - Signal for beam optimization

AG0 - signal for beam optimization

11:30 The beam scanner table can be controlled from
 the barrack - It works correctly -

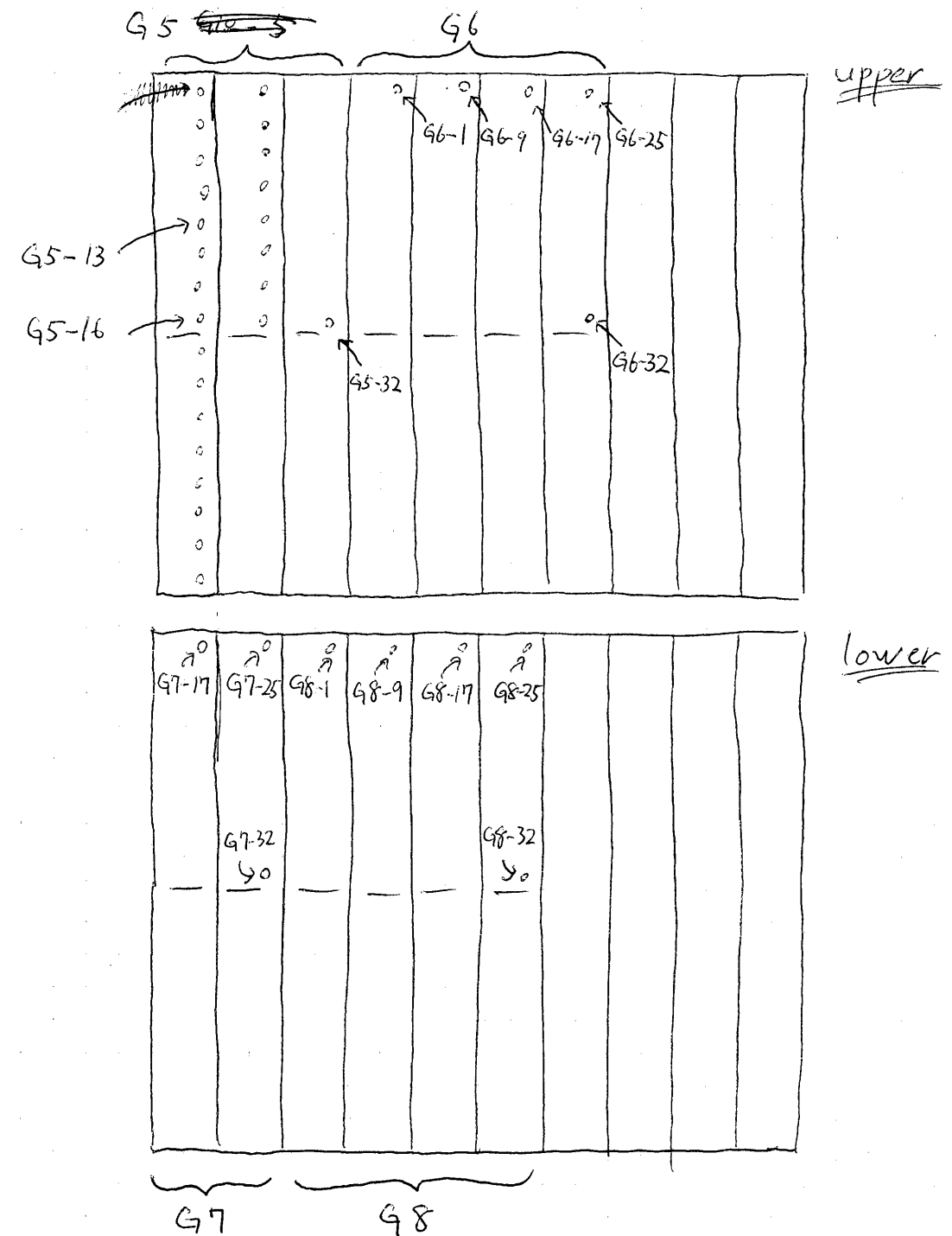
12:07 Isolation vacuum : $2.3 \cdot 10^{-1}$ Pa

Piping vacuum : $1.1 \cdot 10^{-4}$ Pa

Baking of the Xe transfer lines still in progress.

14:00 baking stop

15:00 connect cables from chamber (G5~G8) to splitters



15:30
 15:35
 15:40

re-tighten screws
 P.S. $8.4 \cdot 10^{-5}$ Pa
 re-start baking -

29, Sep, 2003

9:28 8.7×10^{-5} Pa (purification)

9:40 baking stop

10:45 7.0×10^{-5} Pa

The signal and the HV cables for the foreseen scintillator counters runs from the barrack to the beam flange.

they are labeled

TI-counter
SCINT 1
SCINT 2

A set of 4 signal and 4 HV cables for the Pisa NaI run from the barrack to the beam vacuum pumps (near the beam flange)

they are labeled

NaI 1	NaI 2	NaI 3/NaI 4
-------	-------	-------------

~12:00 Xe gas added up to ~0.2 MPa for pre-cooling

15:38 Compressor ON for pre-cooling.

High pressure ~25.5 bar

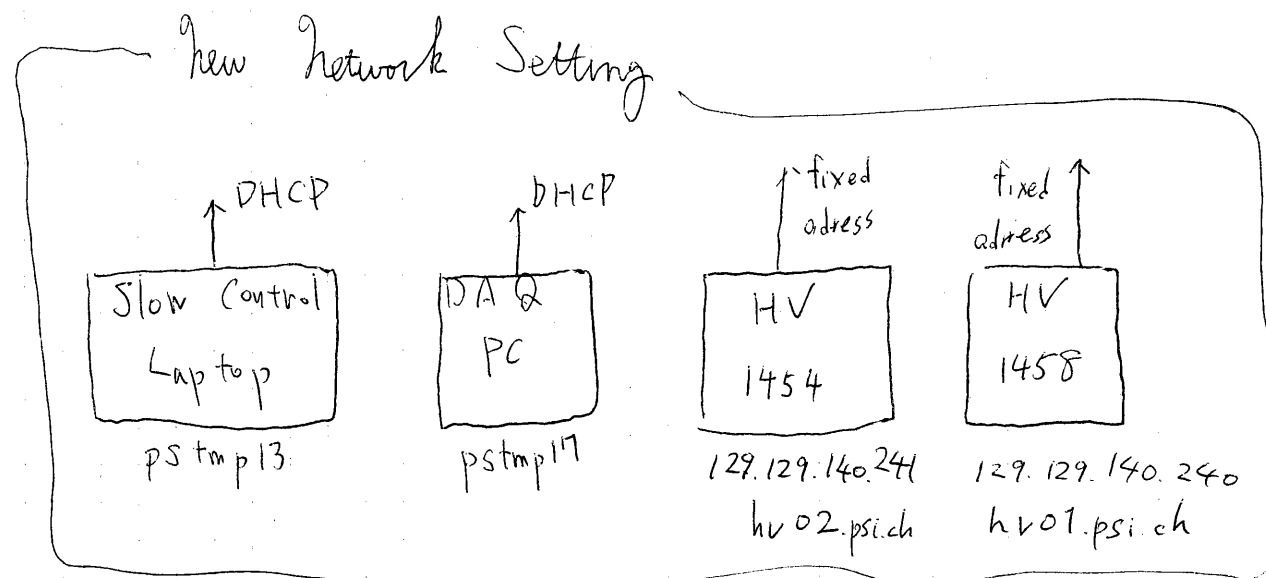
19:00 start pre cooling with LN₂

1/10/2003

Vacuum line piping around Xe bombes

He leak test $< 6.0 \times 10^{-9}$

2:00 start evacuating



changed cable for level meter from twisted pair to co-axial to reduce noise.

Capacitance of cable

upper	2.905	→	0.817 pF	(2.287 nF)
lower	0.875	→	0.837 pF	(2.214 nF)

external/interconnectable level meter

1/10/2003 h1822

→ Recabled all the connections between the LEFT farm out (OLD, previously used) and the TDCs, leaving the delay cables as such. Those delays need to be checked when data are available.

→ checked the connections between F-OUT and BURNBY.

1-48 ok apart ch 25 which shows a strange behaviour (resistance unstable and high ~ 76 Ω)

p5tmp19 slow control setting

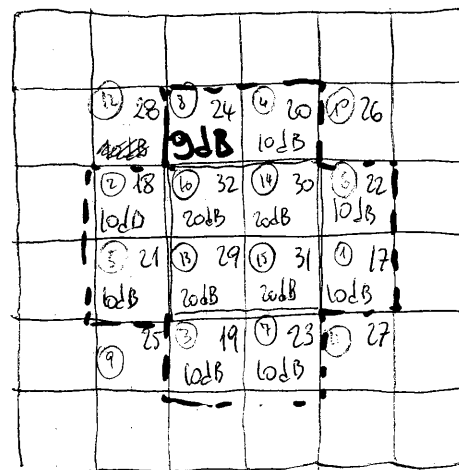
DAQ clin # → /equipment/environment/variables

DAQ clin #	Address	channel		Gain	Offset
0	1	0	LN2 Valve		
1		1	Refrigerator heater		
2		2	heater at bottom of the chamber		
3		3	circulation pump		
4		* 5	Compressor		
5	2	0	Flow meter	4.0	-0.41
6		1	Inner vessel pressure	1.0	0.099565
7		2	Xe tank pressure	10.0	-0.15
8		5	LN2 tank pressure	0.20	-0.20
9		6	Xe temperature (top)	1.00	0.00
10	3	8	LN2 outlet	1.0	-14.6
		*			
11		10	Xe temperature (middle)	1.0	-14.4
12		11 11	Xe temperature (bottom)	1.0	-14.4
13		12	Holder upper	1.0	-17.5
14		13	Holder lower	1.0	-17.5
15		14	Cold head	1.0	-6.2
16		15	heater at bottom of the chamber	1.0	-17
17	5	0	level meter upper		
18		1	level meter lower		

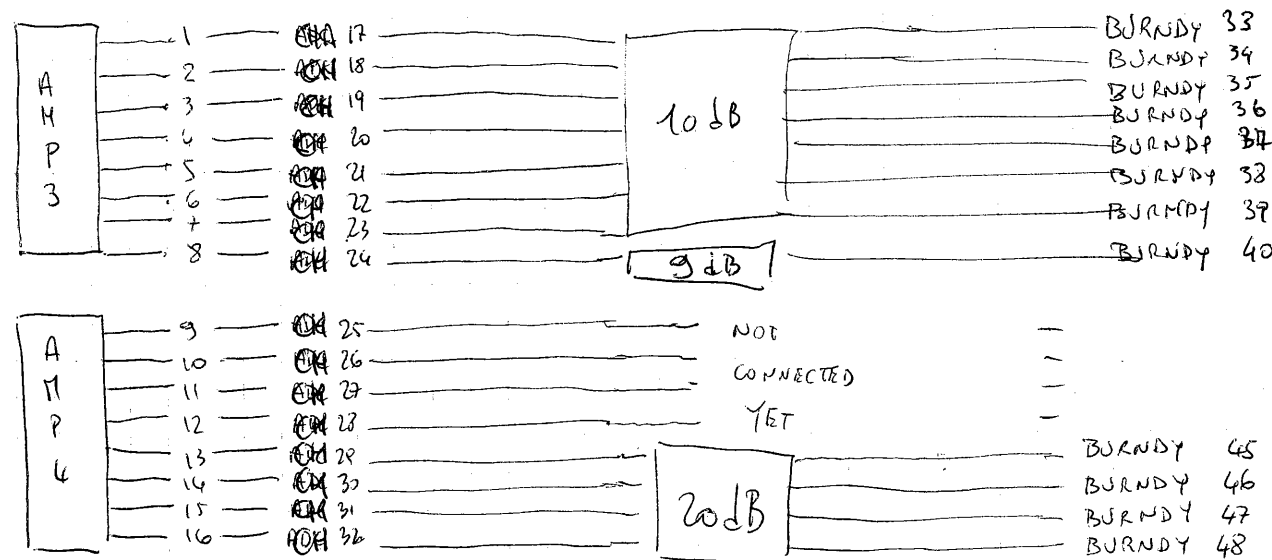
2 oct 03

10:00 Inserted attenuated channels in the BURNDY labeled sq10

FRONT FACE

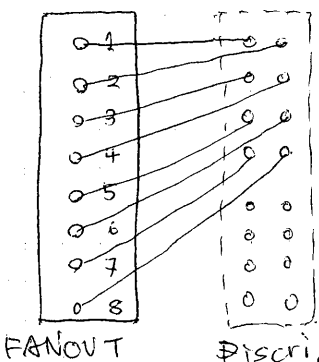


Sq 10



- 11:20 Xe transfer line 9.3×10^{-4} Pa
- 11:25 backing of Xe transfer line stop
- 17:00 Xe transfer line + purification system 5.2×10^{-4} Pa
- 17:20 start liquefaction

FAN OUTs to Discriminators were connected.



- G5-13 ~ G6-12 10 nsec cables (Borrowed from Electric Pool)
- G6-13 ~ G6-29 10 nsec cables.
- G6-30 ~ G6-32 5 nsec (Borrowed from Electric Pool)

02-Oct-2003

22:10 replacool 100L LN₂ tank.

03-Oct-2003

7:30 increase flow rate 10 l/min → 18 l/min

Up to now, 15% of Xenon is liquefied.

Estimation of LN₂ consumption as of 7:30 03/10/03

At 7:30, liquid nitrogen remains in the dewar replaced at 22:10 yesterday, which looks to be 40%

Supposing conservatively 80% of 100 liters was used from 22:10 to 7:30,

80 liter / 9 hours ~ 10 liter/hour

at the xenon flow rate of 10 lpm



8:07

FOR STARTING MSCB (service server) on pstim13

↑
NEC Laptop

type "net start MSCB" on the command prompt.

and you can use the command on the desktop

"MSCB server"

11:00

100 liter LN₂ dewar is replaced.

flow rate 21 l/min

xenon level 23% in lower meter

03/Oct/2003.

11:40.

SC Frontend says "cannot enable module 15".

↳ corresponding to NEGATIVE HV.

Swapping HV module card

slot 15 @ 1458 ↔ slot 0 @ 1454.

→ SC Frontend says "cannot enable module 15" AGAIN!

So, slot 15 @ 1458 is broken (?)

17:00

MSCB server is modified.

Server function is now included in a service.

⇒ No need to start "MSCB server"

Just type "net start MSCB".

then, server function (included in a service)

and the service are invoked.

History function.

You have to start SCFE & (MLogger or FAL)

to keep the histories of environment variables

An MSCB Board Board is repaired (bug fix)

and inserted at the rightmost in the crate.

Please replace the card → Ryu

→ Caitophi

Xenon level is at 40% in the lower meter

03/ Oct / 2003.

22:30. LN₂ tank exchange. 100l → 100l.

04/ Oct / 2003

11:05 LN₂ tank empty.

Stopped GXe flow and changed tank 100l → 100l.

restart GXe flow at pres. of 0.3.

24:05 LN₂ tank replaced 100l → 100l
flow set to 16 lpm

~ 16:00 Hydrogen ~~target~~ target cell is filled ~~up to~~ ^{up to} ~ 2/3 ~~target~~.
For safety reason, the rest of the hydrogen will be
liquefied after the target system is placed on the
beam line.

should
• Shift crew ~~should~~ see ~~the~~ the state of the target systems
at least twice a day (say, 0:00 and 12:00)
and write down the pressure and temperature
parameters on the notebook on the desk in the area.

• We can move the target system before the last filling,
but ~~do~~ not tilt it too much.

05/ Oct / 2003

10:20 LN₂ tank replaced 100l → 100l

Xenon tank pressure 1.5 MPa, flow rate 16 l/min

Surface level is at ~~65~~ 70% of the upper level meter

SUMMARY of LN₂ CONSUMPTION

05/ Oct / 03

date / time	Flow rate	LN ₂ drawn	Total LN ₂
30/ Oct 17:00	Pre-cooling started	400l	
2/ Oct 17:20	liquefaction started		
2:10	liquefaction	100l	400l
3/ Oct 7:30	"	100l	500l
11:00	"	100l	600l
22:30	"	100l	700l
4/ Oct 11:05	"	100l	800l
5/ Oct 0:05	"	100l	900l
10:20	"	100l	1000l

* 20l/min (GAS) ~ 1200 l/hour (GAS) ~ 2.4 l/hour (liquid)
• 15l/min (GAS) ~ 1.8 l/hour (liquid)

⇒ For liquefying 120l liquid
with a flow rate of 20 l/min → 50 hours
15 l/min → 67 hours

16:40 Almost completing liquefaction

The pressure reducer is opened fully.
Reduced Pressure is 3.8 bar.

* HV cables of CR trigger counter are replugged to the other HV. (for NAI).
because slot 15 @ HRN 1458 is broken.
So, ODB entries of HV settings are modified.

Xe top (10mA) 66.7 Ω 58.5 Ω → liquefaction finished
temperature 1mA 57.6 Ω with enough Xe.
(1498/63 flowmeter)
+ 2.0 atm x chamber volume

06. Oct . 2003

15:40 Circulation started flow 10.06 lpm

↳ stopped to install air fan for circ. pump

18:10 Circulation started again flow 9.8 lpm

6/10/2003
21:30

circulation pump is very hot and has stopped.
cool down the pump for 10 min.
restart the pump flow rate ~ ~~3.3~~ 7.3 l/min

H.V. problem.

physical slot #	
1	HV error: replaced module to new one → fixed
11	H.V error: all channels off
12	LUN skips at this slot
↓	
swapped modules at 11 and 12	
11	LUN skips at this slot
12	HV error: all channels off

summary

slot 1 is fixed with replacing module.
module of slot 11 seems to have the same problem as slot 1.
module of slot 12 has another problem

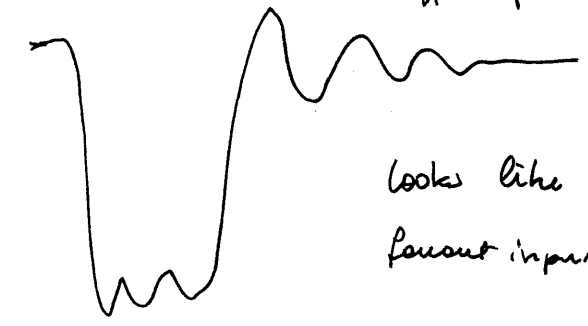
~~make HV connection original state~~
all the channels of slot 11 off ⇒ saved as tmp2.hv

h: 1²⁰ liquid N₂ tank replaced 100l → 100l

7/10/2003

h. 3.00 Plugged HV cables to HV feedthrough.
checking correspondence between ADC & HV.
F13: No signal @ BURNOY. It drains current, no HV is plugged
OK! It was wrongly plugged to the F.out

L11 Horrible but... coffee first!



looks like this in both output & front input.

~~T11~~ Ringing

L4 HV TRIPS!

R17 Same as L11

narrow pulse

38	39
33	35
27	29
20	21
16	17

40 nsec

o: narrow
m: normal

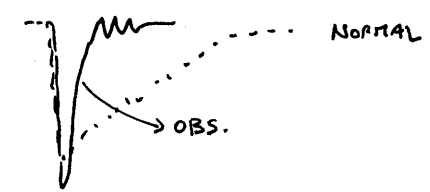
Mistake!!

• splitter was off 8:00 so it was narrow

It was not problem but T23

6:35 stop circulation

We observe a strange spectrum on some PMTs of the TOP face: the spectrum is much narrower than expected



Is it a spectrum in gas Xe?
Is this a hint that the LP is not full during circulation?

These sharp peaks are seen in coincidence with cosmic on other faces PMTs

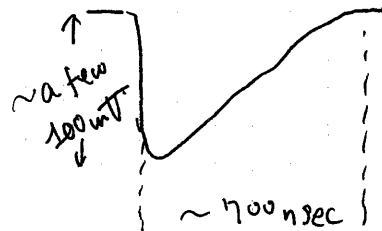
7:25 circulation restart

R33 same as L11

G7-29 was plugged at bundy	sg 11-48) assign of splitter input was wrong ↓ fixed
G7-30 was plugged at bundy	sg 11-45	
G7-31 was plugged at bundy	sg 11-46	
G7-32	sg 11-47	

BK27 noisy
BK15 noisy
BK30 noisy

BK25



R36 noisy
BK29 noisy BK24 noisy

BK1 same as L11

BK11 noisy

BK19 similar to L11

Summary

- miss connections are fixed. Correspondence between HV and bundy is right.
- strange pulse shape (~~FAK~~^{Bundy} OUT output)
 - L11, R17, R33, BK1, BK19 similar shape
 - BK25, , broad
 - T23 , narrow (similar to pulse shape when splitter is off)
- L4 HV trip

7/10/03

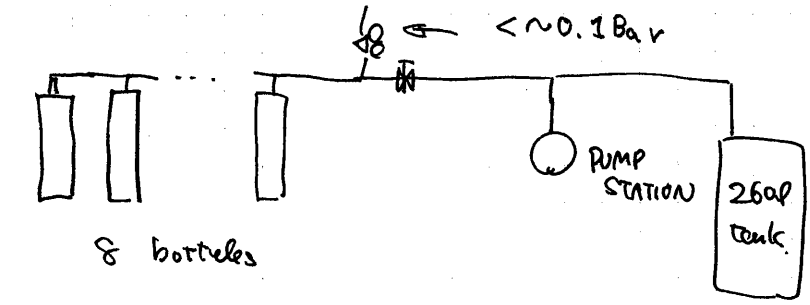
HV problem continued
I found that LUN 11 is not skipped.
The module at slot 11 is available.

(which is located at slot 12 originally)

10:00

Yesterday evening Xenon gas in the 8 bottles was transferred to a 260l tank by cooling the tank with liquid nitrogen.

The pressure in the bottle is less than 0.1 Bar.



The 8 bottles will be removed.

11:30 Liq N2 exchanged 100l → 100l

8/10/03

~1:00 ran out of LN2

1:20 LN2 exchanged 100l → 100l

8/Oct/2003

6:00 @ Current Status on FAL

- △ Problem still remains.
- FAL crashes when run finishes.

@ Change log

- introduced "NAI ϕ " and "CNAI"
raw data subtracted by pedestal

- "Pedestal" for "CNAI"

of channels

N- NAI ^{ADC}	240 → 257	(228 LXe + 16 ^{front} batted LXe + 6 CR + 4 TC + 1 TC veto)
NAI		<small>includes 4 spares. + 2 spares) 2LSP</small>
N-FTDC	128 → 192	
N-CTDC	47	(36 PMTs in LXe + 6 CR + 4 TC + 1 TC veto)
N-NAI	72	(8x8 NaI + 8 spares)

* TC = Plastic Scinti. trigger Counter
 CR = trigger Counter for Cosmic rays

• Banks:

- PFLG --- obsolete, then removed. it was for unstable pedestal run.
- ASUM } --- are almost same as HIST. Both removed.
- HISG }
- "n-hit" in HIST was imported from ASUM.

10:00. Concerning HV module (Slot 12 @ LRS1458), (See Ryu's Report 06/Oct.)
 We checked it, and we found 1 broken fuse,
 this is same problem as previous case.
 Consequently, we have 13 good modules and 2 NG modules @ LRS1458.
 Now, we're waiting for delivering new fuses.

08/Oct/2003

Attention

pressure of LM2 tank was 5 bar !!
 Shift person must be careful of it.

14:45 We installed the Negative HV module to Slot 12 @ LRS1458 as a "DUMMY" module.

Since SCFE doesn't recognize a null slot.

So, now:

{ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	← Slot No.
{ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 X	← status.

slot 12: dummy module (negative card).
 slot 15: null

A new HV setting file is established.

- △ L4 (HV18) ... 0V.
- △ R38, BT38, L38, T38 } ... 0V.
- R39, BT39, L39, T39
- R37, BT37, L37, T37

↳ corresponding to slot 12.

c:\online\hvdata\
 hvdata-05-oct
 1e6_031008_mai
 .hv

We must load new hv setting file for a moment
 till delivering new fuse for broken HV module.

15:01. Test RUN for LED gain calibration.

5279. pedestal RUN. ~ 6000 events taken.

▶ HV trip! L24 (HV 9-10) supplied, again.

5280 LED RUN. (LED1&5)

15:15

5281. α -RUN.

▶ HV error occurred: BK10 (HV 13-5). supplied again OK.

08/Oct/2003.

16:10 HV error occurred. L-24. (HV 9-10).

Again. Second time!!

L-24 is unstable???

16:42 RUN # 5282. pedestal. RUN.

16:47. RUN # 5283. Cosmic-Ray RUN. started.

HV error occurred, again: L24 (HV 9-10) → 3 times!

BTQ (HV 1-1).

⚠ L24 ⇒ OV.

- BTQ ⇒ HV supplied, again, OK.

HV error!

- L0 (HV 3-2). Supplied again, OK.

12:27. the first pedestal data was analyzed @ offline.

Mean value of σ of pedestal distribution \sim 0.288 ch.

All channels OK!

12:36. Stop the RUN # 5283.

LED data (# 5280) is NG.

LED's are not flushed???

We modified the Attenuator setting for LED driver.

11.8 dB ⇒ 9.4 dB ⇒ 8 dB

18:47. # 5284. LED calibration TEST RUN. (with 8 dB attenuation)

⚠ CAMAC crate ALARM!! ⇒ fuse check, OK.

⇒ restart. OK. why???

08/Oct/2003.

20:23. # 5285. pedestal run.

20:25. # 5286. Cosmic ray RUN.

stop 5286

20:29 # 5287 α

ODB crashed.
removed ODB.stm and loaded
08...odb. restart, OK.

5287. failure

- According to the data # 5284.

Step 1 & 2 are too dark.

We modified the setpoint value of
voltage for LED.

⇒ 92. 94. 96. 98. 100. 102 V.

with 8 dB attenuation.

21:06. # 5287. LED calibration RUN. with New LED voltage set.

HV setting file updated. L24 ⇒ OV. "1e6-031008-nai.hv"

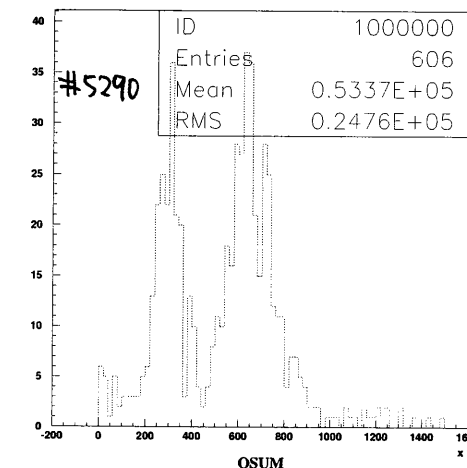
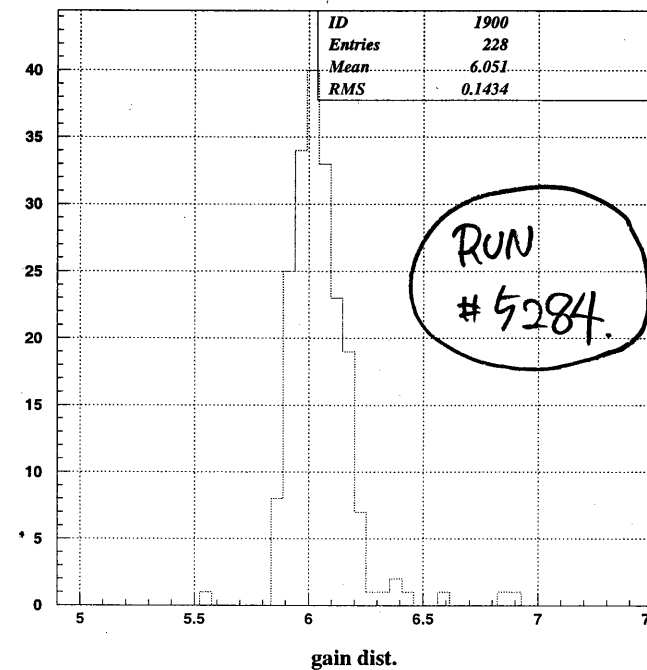
21:30. # 5288. α ray RUN.

21:55 # 5289 pedestal Run

21:55 # 5290 cosmic ray Run.

09/Oct/2003

06:20 # 5290 stopped



09/Oct/2003

6:52 #5291 ~~run~~ pedestal run

ADC-#159 (st11-M92) has a mean of 2697ch.

→ This mini-card should be exchanged.

ⓐ "Added "NaI calibration" module to ODB.

cf. /Equipment/Trigger/Variables/NAI0 CNAI

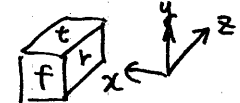
histogram ID: 5000 → 5011

2249M S12-0ch 2249M S11-4ch

/Analyzer/Bank switches/NAI0 CNAI

/Analyzer/Modules switches/NaI calibration

→ measures pedestal in "0: Pedestal Run"

ⓑ right-hand coordinate  in "analyzer.c", "histo.c".

ⓐ Changes in FAL

- newly made "frontend.h" to share the information about FB/CAMAC modules.
- Too many comments!!

→ Back-up them into C:\online\src-script-backup*.c, *.h, *.kamac, ...

7:45	replace	mini card of st11-M92	} Because of bugs in "naicalib.c". ⇒ removed #5292~#5294. "naicalib.c" modified.
7:47	#5292	pedestal #159 → ok	
7:49	#5293	LED	
		FAL crashed	
7:56	#5294	LED again	

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8:13 #5292 pedestal. ok.

8:16 #5293 LED 1&5 (-10dB)

8:21 #5294 α particles run.

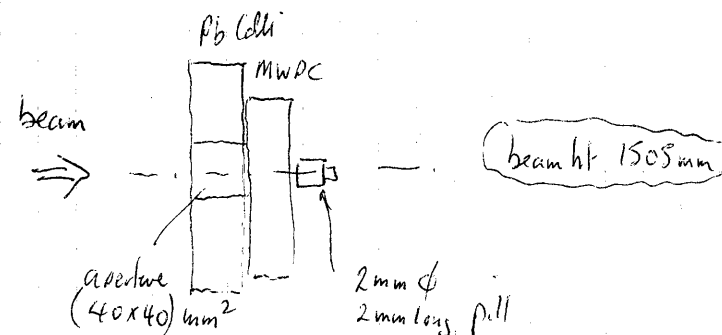
8:27 #5295 cosmic ray

9:30 • change LN₂ 100 l → 100 l stop circulation

10:00 start circulation

10:30 P-RK on board. Ready for beam tuning

Check area we have:



The pill counter is placed 5mm DS of MWPC ~ @ location of Window of Target vessel. 16mm DS actually.

Pill is centered on beam-axis

Scanner Coordinates:

V: 197.3 mm
H: 139.4 mm

Scanner Coords: [Looking DS]

Set starting values for beam-tuning file: Meg111.set. on SET POINT PROGRAMME

MWPC initial profile vertically ~ centered horizontally cut-off ASYS1, ASCS1 need tuning

MWPC HV MAX -3KV present gas mixture 70% Ar : 30% CO₂

It should be 80%:20% hence gain must be turned up more

MegIII.set

Actual Settings -- Thu Oct 09 10:49:44 2003

Device	DAC	ADC	Scaling
QTH51	927	0.2242	1.0
QTH52	-467	-0.1116	1.0
QTH53	0	0.0002	1.0
ASZ51	-2755	-0.2020	0.3
QTB51	524	0.1267	1.0
QTB52	-309	-0.0730	1.0
ASY51	-724	-0.1736	1.0
QSL51	-241	-0.0606	1.0
QSL52	760	0.1853	1.0
ASL51	-11615	-0.1736	1.0
QSL53	-663	-0.1609	1.0
QSL54	1050	0.2530	1.0
SSL51	0	0.0000	1.0
SSK51	0	0.0000	1.0
FSH51	110 110	0.2759	4.1 OUT
FSH52	350 350	0.3507	4.1 OUT
DSC51	4mm Deg	0.3092	4.1 OUT
DSC52	2mm Deg	0.3636	4.1 OUT
FS53-O	170	0.1707	4.1
FS53-U	170	0.1709	4.1
FS53-L	170	0.1692	4.1
FS53-R	170	0.1712	4.1

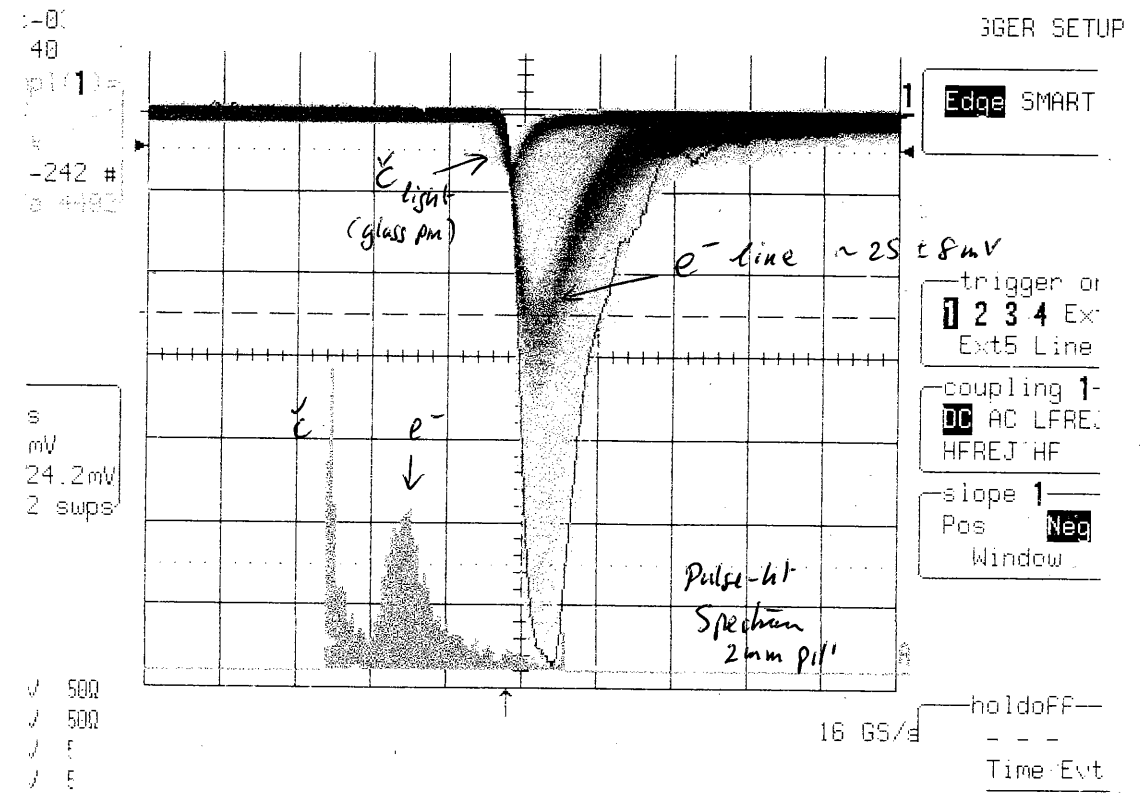
$\left. \begin{matrix} \sim 370 = \text{OUT} \\ 0 = \text{IN} \end{matrix} \right\}$
 closed to 170 in file = 650

Low @ mu counter HV = -600V - See 2 distributions

electron line $\sim 25 \pm 8$ mV before X10
 Eerenkov up to 5 mV before X10

180 optimize QSL53/54 no degrader on e+

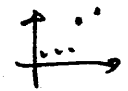

QSL53 +703
 QSL54 +922



16:30 broken fuse replaced for HV slot 11 & 12
 HV applied for PMTs in slot 11 & 12

New HV file ~~to~~ hvdata_05-Oct_2003
 \$ 1e6_031009_nai.hv

16:45 PROBLEMS WITH ADCs FROM CALIB. RUN #5287

- ADC 10: The gain is too high (7×10^6) R8 (900V $\frac{8}{14}$ from 885V $\frac{4}{14}$)
- ADC $\left. \begin{matrix} 24 \\ 25 \\ 26 \\ 27 \end{matrix} \right\}$ Last point is too low oh
oh
oh
ok
- ADC 40 $\frac{2 \times 10^6$
- ADC 61 OFF L4
- ADC 64 OFF L20
- ADC 76 The gain is too high (7×10^6) L13
- ADC 120 Bad signal @ the Fan out. T23 change: moved to another Front channel
- ADC 127 gain too high (2.5×10^6) efficiency low?? FROM RACK 1 - LAST - 1
TO RACK 2 - FIRST - 1
- ADC 134 OFF R26
- ADC 146 gain too LOW (6.5×10^5)
- ADC 148 \rightarrow 157 } Missing HV, known problem
 159, 162
- ADC 172 OFF L24
- ADC 184 \rightarrow 195 } Missing HV, known problem
- ADC 207 
- ADC 218 OFF BK25
- ADC 222 

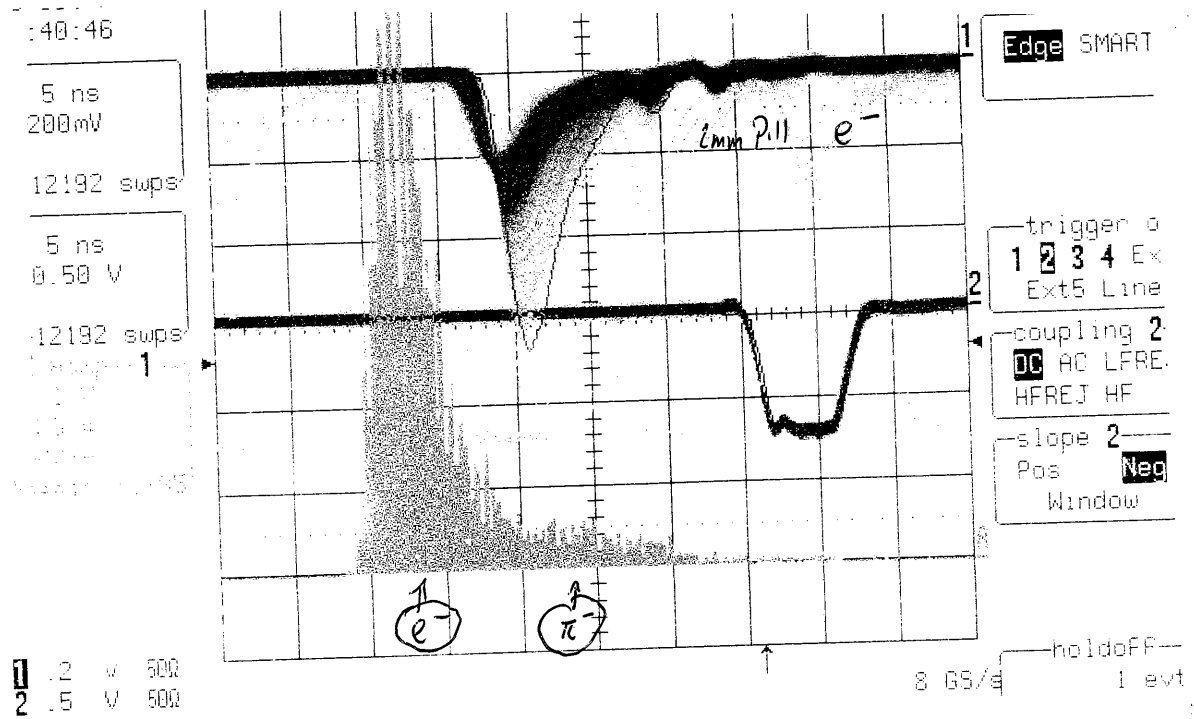
17:30 broken fuse replaced for ADC (FB) slot 11, B
 (2A fuse).

MES111e.set
 Actual Settings -- Thu Oct 09 18:11:37 2003

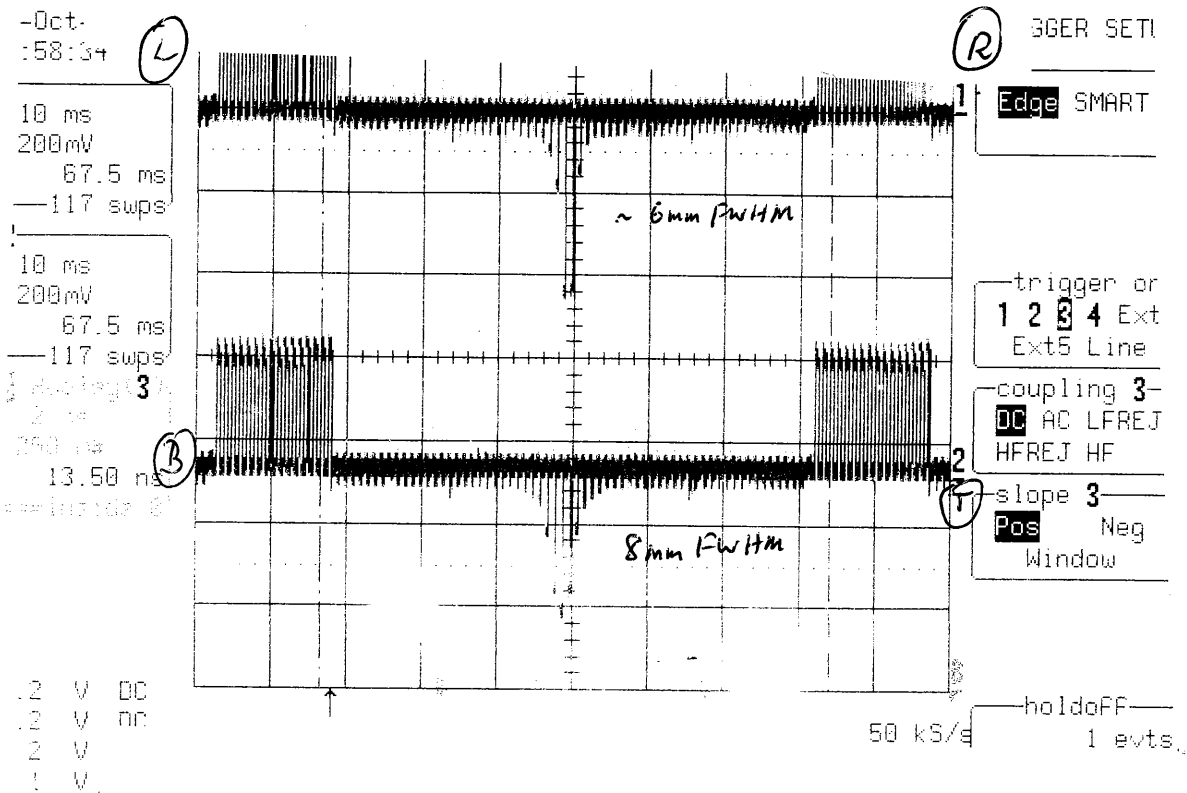
Device	DAC	ADC	Scaling
QTH51	1156	0.2794	1.0
QTH52	-397	-0.0948	1.0
QTH53	0	0.0000	1.0
ASZ51	-2755	-0.2020	0.3
QTB51	506	0.1223	1.0
QTB52	-235	-0.0552	1.0
ASY51	-732	-0.1756	1.0
QSL51	-250	-0.0628	1.0
QSL52	713	0.1739	1.0
ASL51	-11976	-0.1795	1.0
QSL53	-639	-0.1553	1.0
QSL54	904	0.2176	1.0
SSL51	0	0.0000	1.0
SSK51	0	0.0000	1.0
FSH51	110	0.2757	4.1
FSH52	100	0.0991	4.1
DSC51	370	0.3048	4.1
DSC52	370	0.3636	4.1
FS53-O	650	0.6496	4.1
FS53-U	650	0.6498	4.1
FS53-L	80	0.0791	4.1
FS53-R	80	0.0813	4.1

Optimized e^- beam
 Values after tuning

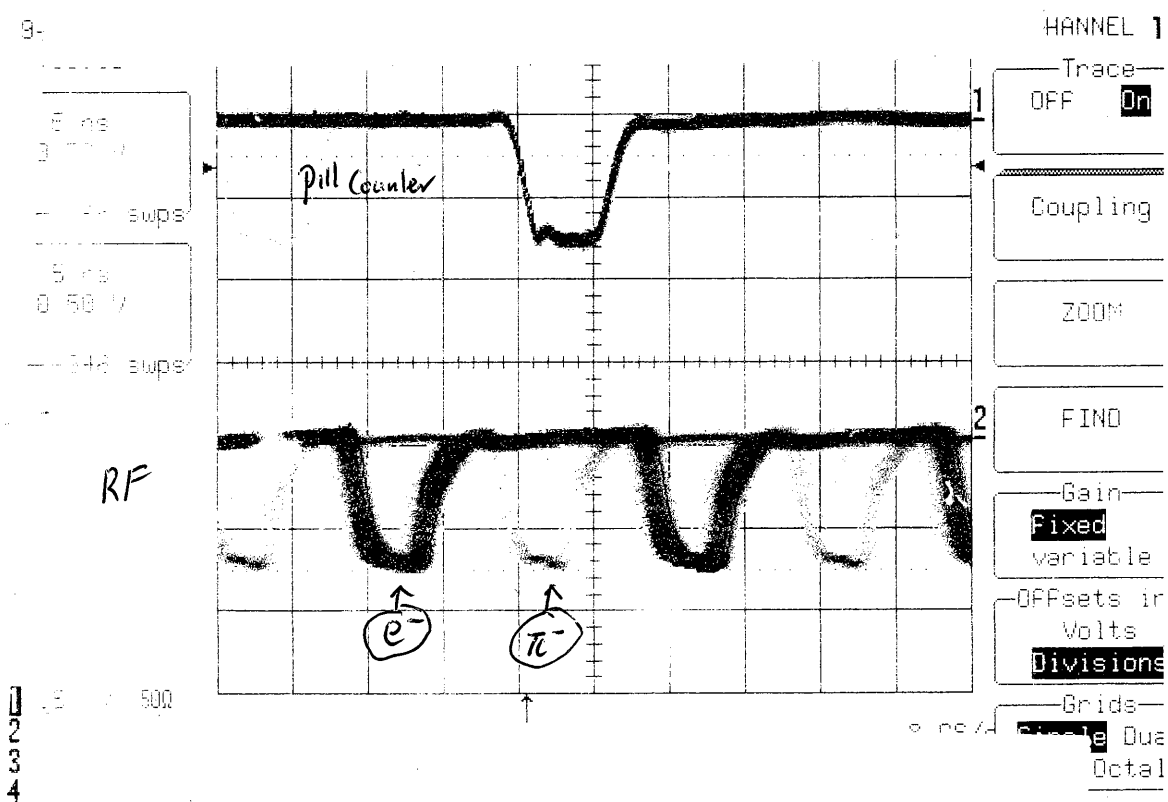
Rate 445 k/10⁵p
 ~0.57 sec
 with slit settings shown.



Horizontal & Vertical electron beam profile close to final focus



So we see π^- !!!
 Pill - trigger lock @ RF



N.B. problem with RF signal need filter
 have inserted capacitive filter @ i/p

19:10 #5296 pedestal run.

T8 overflow (4095 ADC counts) (ADC 9)
 T35 value 0 (ADC 160)
 HV error BT9 (HV -1) occurred.
 → several times.
 → if next time this occurred.
 we should shut this channel to OT.

#5297. pedestal run. ⇒ failure

same ADC channel problem. (ADC 9 & ADC 160)

13-10 card.
 11-93 card
 ↑
 second time

these 2 channels are replaced.

#5298. pedestal run. @ ~~BEAM ON!~~

Replaced cards are fixed. → shutter closed.

#5299. pedestal run @ BEAM ON, Shutter OPEN.

Mean value of ~~pedestal~~ distribution of pedestal 5.

#5298. (shutter closed) ⇒ 0.7315.

#5299. (shutter open) ⇒ 0.7836.

Bad

20:33

#5300. LED calibration run. @ BEAM ON.

↓
5301.

21:25 α particle run #5302
 (a) Shutter open } Bad

21:35 Cosmic ray run #5303.

these data cannot be used. (#5298 ~ #5303.)
 because - ADC channels of Sig.3. & Sig.10 cables
 are shifted. (mis. connection.)

→ fixed.

so, these calibrations will be taken again.

21:50. pedestal run. #5304

CAUAC crate ~~ALARM~~ ALARM, again!

This crate ~~is~~ replaced another one. → "w/ENER" owned by PSI

ADC 98, 112, 114, 121, 124, 126, 132, 143, 145, 146, 147, 148, 155, 163
 changed to new ones. (MINICAND)

These were not exchanged, but PAQ ~~was~~ worked well.

1:11 #5305 pedestal run

1:14 #5306 LED 1 & 5 run

1:40 #5307. α -run. @ BEAM ON, shutter open.

2:30. Liq. N₂ tank. exchanged. 100 l → 100 l.

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Σ

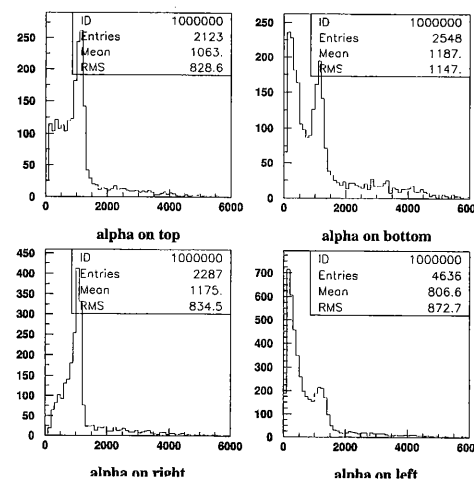
1:55 LN₂ run out.

2:10 exchanged 100 l → 100 l. circulation stop

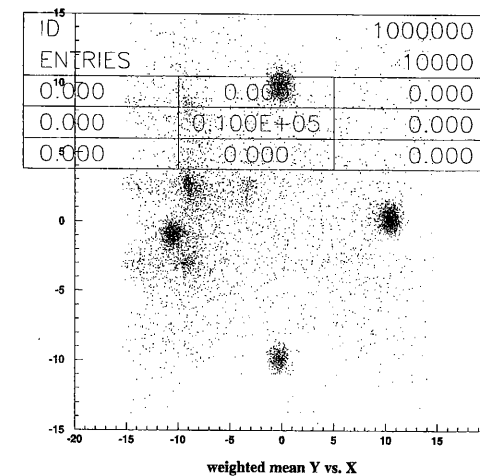
2:21 circulation restart.

2:47. #5308. α -run. Beam shutter. closed.

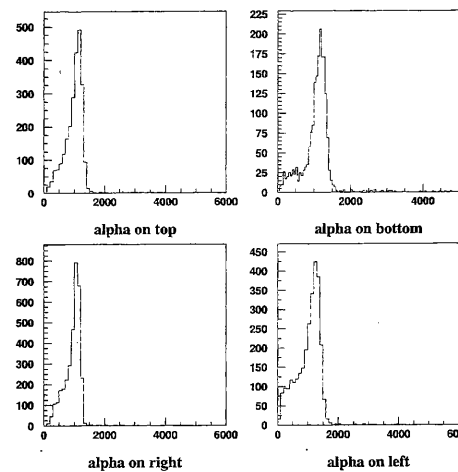
↓ #5307 w/ beam



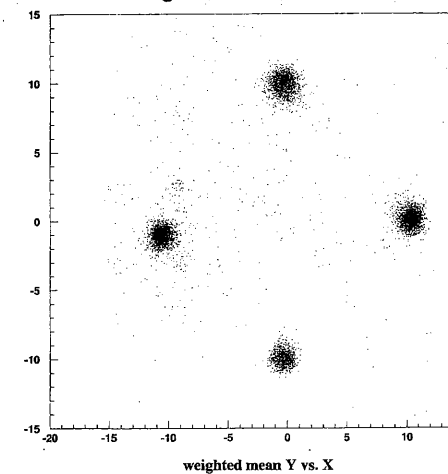
↓ #5307 w/ beam



↓ #5308 w/o beam



↓ #5308 w/o beam



2:55 #5309 CR-run ~~w/~~ beam, w/ circulation.

∩

6:27 #5309 stopped

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8:45	#5310	pedestal	w/o beam?	w/ circulation	HV 1458 was off
8:47	#5311	LED	"	"	
8:53	#5312	α	"	"	
9:11	#5313	pedestal	w/o beam?	w/ circulation	HV slot 12 was off
9:11	#5314	LED	"	"	
9:17	#5315	α	"	"	
9:27	#5316	CR	"	"	
10:29		stop			

• ~~Bug fix on gain table file "*.xls" in LED run.~~
 "*.xls" was available only in HV adjust run. \rightarrow every LED run.

new feat.: FAL outputs gain table in "adcfi-#.xls" after LED run.

11:30 #5322 pedestal run. pedestal distribution (#105 3.33 ch
 #120 5.39 ch)

HV slot 12 was off
~~load~~ loaded le6-031009_nai.hv

11:49 #5324 LED run

	ADC #	gain (online calculat.) / le6	# hv	new value
(R8	10	7.95	980	\rightarrow 778
L13	76	5.24	1100	\rightarrow 915
BT31	155	5.86	1300	\rightarrow 1068
BK13	222	0.36	1046	\rightarrow 1173
BT38	194	0.51	776	\rightarrow 837

change HV (R8, L13, BT31, BK13, BT38)

12:03 #5325 LED run

(R8	10	0.63	778	\rightarrow 819
L13	76	0.58	915	\rightarrow 972
BT31	155	0.83	1068	\rightarrow 1090
BK13 BT38	194	0.95	776 \rightarrow 800	1173 \rightarrow 1180

changed HV (R8, L13, BT31, ~~BK13~~, BT38)

Signal of #194 is too small. impossible to fit at online
 we will estimate gain at offline analysis.

12:21 #5326 LED

	ADC #	gain	HV
(R8	10	1.19×10^6	972 \rightarrow 925
L13	76	1.57	
BT31	155	1.06	
BT38			800 \rightarrow 950

changed HV (L13, BT38)

saved HV set up as "le6-031010_nai.hv"

12:37 #5327 self trigger run w/ beam

12:42 #5328 LED w/ beam \rightarrow stop

12:45 #5329 self trigger run w/o beam

#5330 LED

Scaler introduced!

0		ch \emptyset	# of accepted events.
1	Station 21	1	# of triggered events
2		2	LED/pedestal trigger \sim 100Hz
3		3	self gamma trigger (LXe)
4		4	α trigger
5		5	CR trigger
6	Station 22	\emptyset	} not assigned yet.
7		1	
8		2	
9		3	
10		4	
11		5	

13:00 stop circulation

change LN2 tank 100 l \rightarrow 100 l

13:25 restart circulation

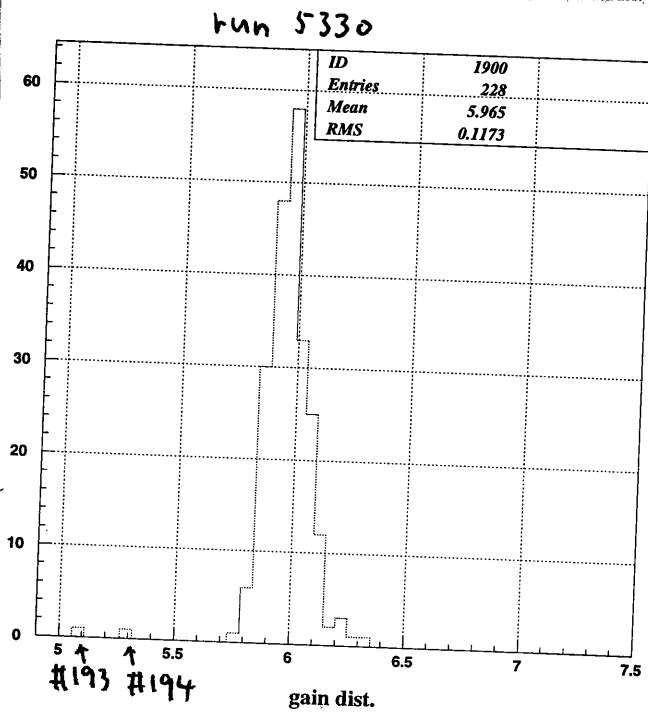
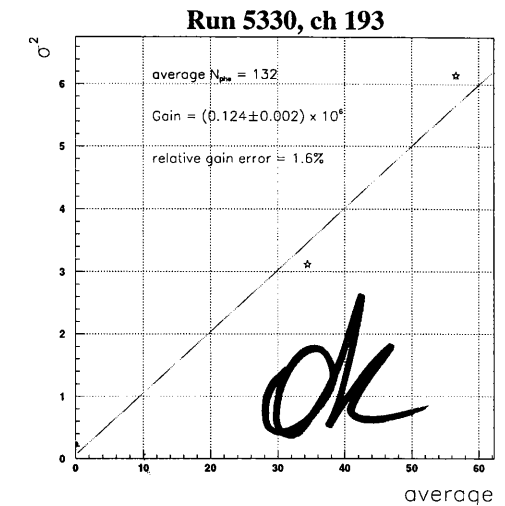
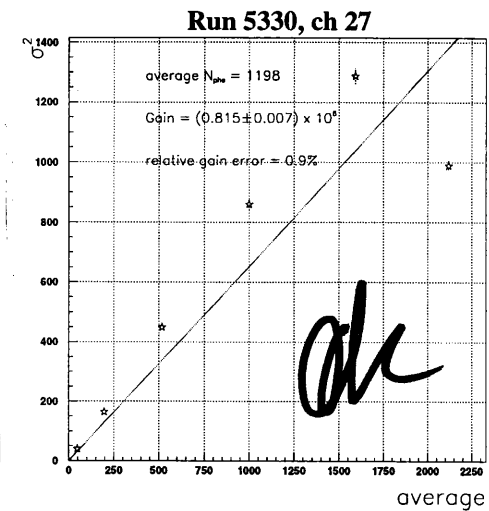
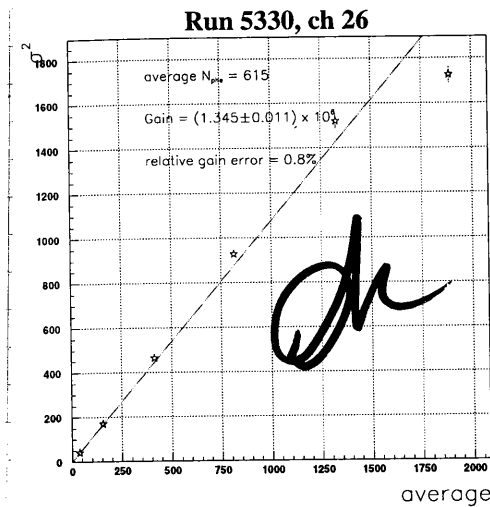
10 Oct 2003

@ DAQ fixed.

FB TDC module in slot-6 moved to slot 7. \Rightarrow O.K.
FAL can be invoked now!

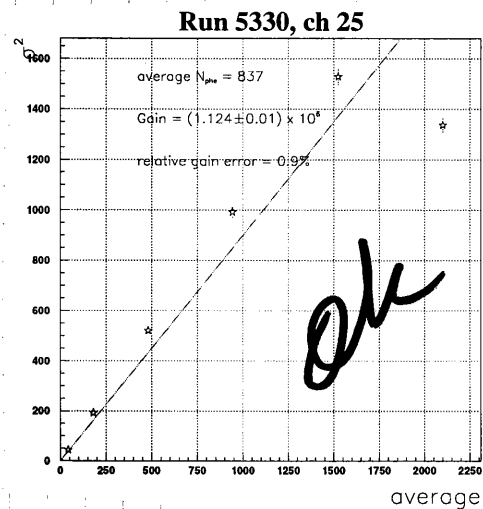
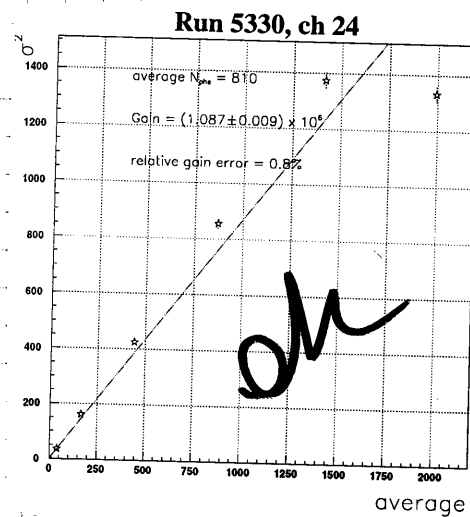
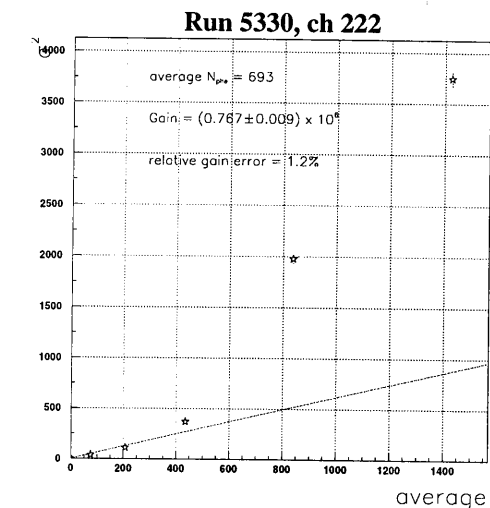
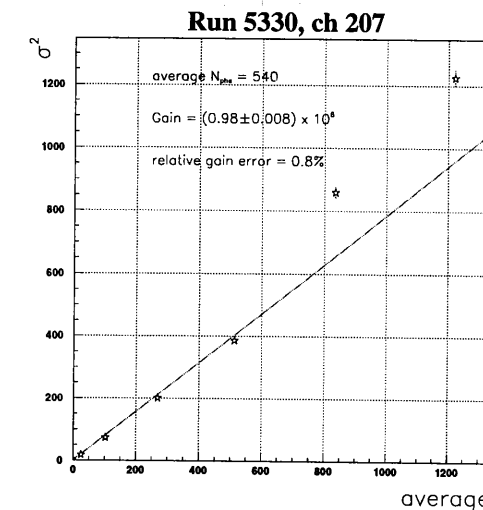
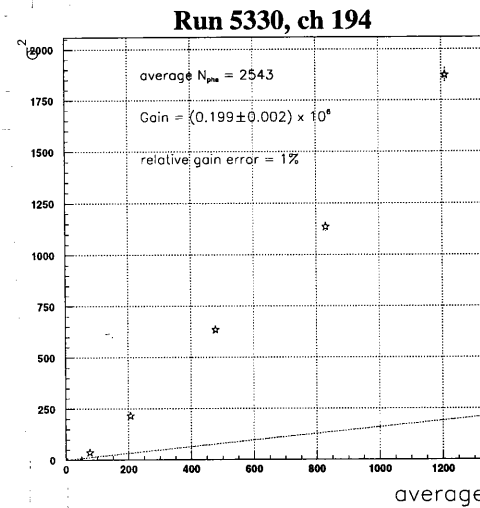
@ But ~~FAL~~ ^{FAL} crashes whenever the data taking finishes.
 \Rightarrow Not always... Need to be investigated carefully

10/10/2003



hv le_031010_nai_hv"

plots of bad channels at
LEO calibration



Status of TDC implementation

- After investigation by KO. FAL can be invoked anywhere.
- Several times FAL crashed at the end of a RUN, but not always.
- When the FAL crashes, it is thought to happen at "hrput", suggesting that the problem is related to ZEBRA!!!
- If you want to avoid the crash and need not to see TDC data, switch off two analyzer module } TDC calibration } TDC timing by setting the ODB switch in (Analyzer/ modules
- When KO comes back this night, he will continue investigation with connecting cables from discriminators to TDC

15:15 SATPh

15:25 Swapped ADC 24 & 28 ON THE FANOUT #4
 25 & 29
 26 & 30
 27 & 31

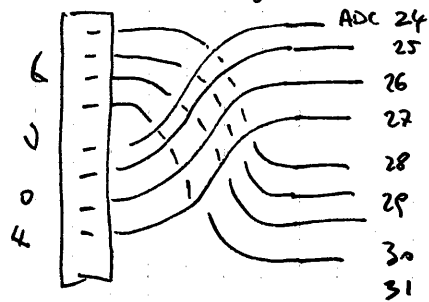
changed replaced burst guard in FANOUT for ADC 24-27.

#5340 LED

ADC 24-27 look good.

Problem of ADC 24-27 was the burst guard in FANOUT and it is fixed!

to investigate the bad behavior of ch. 24-27.



IF BAD ARE 28 29 30 31 ⇒ SIGNAL PROBLEM
 " " " 24 25 26 27 ⇒ BURNDY-BURST-ADC Problem

#5341

Pedestal @ 1e6 BEAM ON

#5342

LED Run @ 1e6 " "

16:50

20mm graphite degrader inserted for beam-tuning between the wire chamber and pill counter

17:00

Rise HV of ADC 193. (10⁵ percent gain)

194. bad ~~response~~ pedestal? The obtained gain is wrong

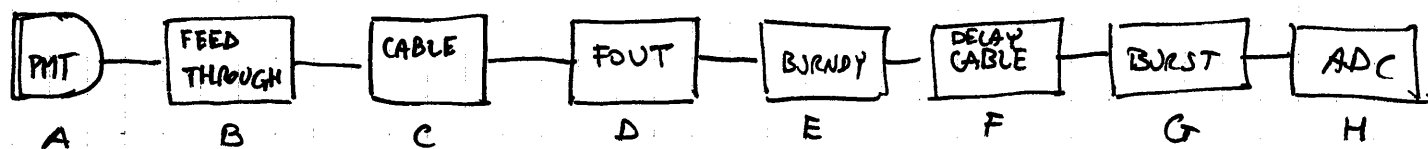
CHECK RUN 5337 ⇒ The bad ch are 28, 29, 30, 31!!! ⇒ ADC OK
 Recount as before.

Swapped 24 & 28 at the INPUT of F.OUF.

RUN 5338

If the bad is ADC 24 ⇒ is a BURNDY-FOUT-BURST
 is ADC 28 ⇒ is a PMT problem TO FANOUT

28 ok
 24 Bad



(A24)	(B24)	(C24)	(D24)	E24	F24	G24	H24	⇒ BAD
A24	B24	C24	D24	E28	F28	G28	H28	⇒ BAD
A28	B28	C28	D28	E24	F24	G24	H24	⇒ ok

G10

8-9 ADC 204 was not plugged. now ok
 8-23 ADC 218 burndy min load. (FOUT → BURNDY cable replaced)

19:10

ADC 64: The cable from burndy to ADC is bad (no signal, ~~open~~ short: cable resistance = 7Ω)
 Relocate ADC 64 to? SGG 1ST PIN
 → Modified acquisition accordingly.

19:45

ADC 134 Burndy pin was badly plugged. Replugged
 Hope it's ok.

ALL "NO SIGNAL" SHOULD BE OK NOW
 (Apart from HV trip...)

unplugged third-out put of FAN-OUT (AMP connector)

#5339

↑ ARE STILL BAD
 (24-25-26-27)

20th Beam tuning finished for today - it took all day to find π^+ 's and lock onto them - Now can continue tomorrow (late morning) to optimize the π^- -beam:

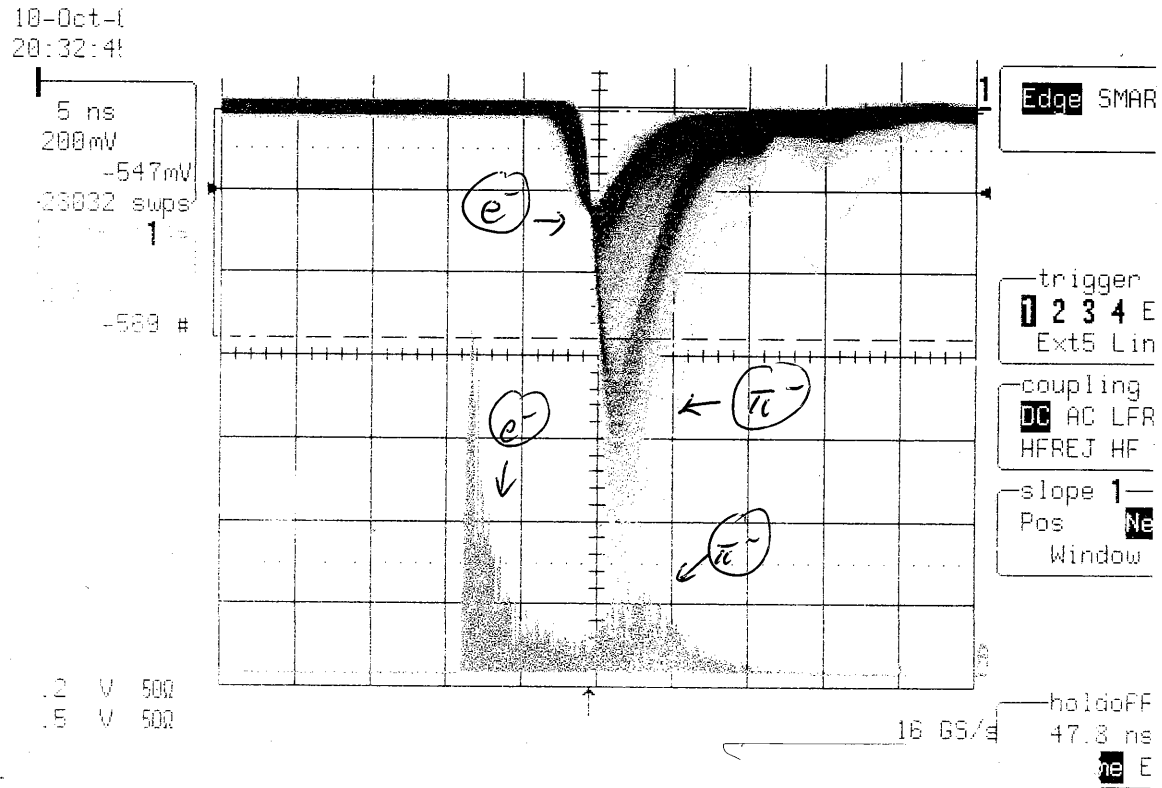
We now have 20mm C degrader in front of pill center this separates the pulse between e^- & π^- from factor 2 to factor 3

$$e^- \sim 250 \text{ mV}$$

$$\pi^- \sim (700 \pm 100) \text{ mV}$$

Drill threshold 550 mV (pA)

Optimization done with p.u. RF



Present Rate 2.3 k/10⁵p for Slits & 2mm pill
 0.577 sec @ 1770 μ A
 Pill-RF

Megill.p.start.set

Actual Settings -- Fri Oct 10 20:09:46 2003

Device	DAC	ADC	Scaling
QTH51	1277	0.3087	1.0
QTH52	-653	-0.1565	1.0
QTH53	0	0.0000	1.0
ASZ51	-2755	-0.2020	0.3
QTB51	554	0.1338	1.0
QTB52	-234	-0.0549	1.0
ASY51	-719	-0.1724	1.0
QSL51	-242	-0.0608	1.0
QSL52	738	0.1800	1.0
ASL51	-11562	-0.1729	1.0
QSL53	-627	-0.1524	1.0
QSL54	865	0.2081	1.0
SSL51	0	0.0000	1.0
SSK51	0	0.0000	1.0
FSH51	110	0.2757	4.1
FSH52	200	0.2005	4.1
DSC51	0	0.0562	4.1
DSC52	370	0.3636	4.1
FS53-O	650	0.6496	4.1
FS53-U	650	0.6498	4.1
FS53-L	80	0.0794	4.1
FS53-R	80	0.0801	4.1

MWPC HV OFF
~~XXXXXXXXXXXXXXXXXXXX~~

Optimization will continue tomorrow
 I call it a day & "abandon ship" !