Summary of hclog entries related to shielding configurations used during

TJNAF Exp. 93-026 - G_e^n

compiled by O. A. Rondon

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Instructions for use

These entries are in booklet format, so they print doublesided and they are folded at the middle of the page to form a booklet (4 non-consecutive pages per sheet). It is suggested the user print them in this fashion. They are cumbersome to use otherwise.

User name gwarren
Log entry time 22:05:27 on October 1,1998
Entry number 9517
keyword=Proton Energy Losses in ndet for Q2=1.0
Proton energy losses in ndet for Q2=1.0 point with current shielding.

proton kinetic energy = 200.00 MeV
proton momentum = 644.44 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	200.00	152.68	47.32	4.127
1in Plastic	152.68	138.26	14.42	0.473
1	138.26	132.28	5.97	0.312
2	132.28	126.11	6.17	0.326
3	126.11	39.56	86.55	1.202
4	39.56	0.00	39.56	3.833
5	0.00	0.00	0.00	0.000
6	0.00	0.00	0.00	0.000
7	0.00	0.00	0.00	0.000

proton kinetic energy = 250.00 MeV
proton momentum = 729.13 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	250.00	209.53	40.47	3.345
1in Plastic	209.53	198.04	11.49	0.349
1	198.04	193.39	4.65	0.220
2	193.39	188.67	4.72	0.225
3	188.67	136.02	52.65	0.814
4	136.02	60.14	75.88	1.117
5	60.14	0.00	60.14	2.509
6	0.00	0.00	0.00	0.000
7	0.00	0.00	0.00	0.000

proton kinetic energy = 300.00 MeV
proton momentum = 808.06 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	300.00	263.82	36.18	2.824
1in Plastic	263.82	253.90	9.92	0.280
1	253.90	249.94	3.97	0.174
2	249.94	245.93	4.01	0.176
3	245.93	203.37	42.56	0.633
4	203.37	154.03	49.34	0.758
5	154.03	89.48	64.55	0.990

User name cmh7k

Log entry time 22:38:21 on June 27,1998

Entry number 6082

This entry is a followup to: 6079

keyword=anode current measurement summary

Summary of neutron detector anode current measurements:

Plastic seems to help the current in the first few layers. The average current in the first veto layer dropped from 50 microamps to 28
microamps. For the second veto layer, the current dropped from 45 microamps to 22 microamps, and for the first bar layer, the current
dropped from 70 microamps to 45 microamps (all three sets of numbers are for left side currents only). The second through fifth bar layers
saw less if any reduction in current (which is to be expected).

The second conclusion is that the right side has slightly higher currents than the left, but not dramatically higher. Right side currents were, on
average, about 20 percent higher, but much of this higher average seems to come from a single detector in each plane.

It should be noted that bar#66 seemed especially messed up, with its left current at only 4 microamps, but its right current at 55 microamps.

User name mitchell

Log entry time 18:03:02 on June 27,1998

Entry number 6062

keyword=N-det shielding

Accelerator system checks at 4:30. We took 45 minute access to change
neutron detector shielding. Added 1 inch of plastic, 4ft by 8 ft sheet
covers most of the detector. Not enough to get to top two bars, and not wide enough
by about 10 inches. We shoved it over in order to cover the small angle
side.

Log entry time 22:20:45 on June 27,1998

Entry number 6079

This entry is a followup to: 6063

Followups:

6082 06/27/98 22:38 cmh7k anode current measurement summary

keyword=anode currents on neutron detectors at nominal luminosity

Anode currents on neutron detectors after installation of plastic sheets in front of array. Beam current 100 nA; 3cm CH target.

Fornmat: Layer; Detector position; value micro amps Left (L) ; value micro amps Right (R)

veto layer 1 #3 23L 30R
#7 27L 37R
#13 35L 22R
#18 25L 60R
veto layer 2 #24 20L 24R
#30 22L 25R
#36 25L 25R
bar layer 1 #2 40L 35R
#6 35L 65R
#12 60L 75R
#18 45L 47R
bar layer 2 #22 33L 60R
#28 75L 74R
#34 40L 30R
bar layer 3 #38 20L 22R
#44 22L 22R
#50 20L 22R
bar layer 4 #54 35L 22R
#60 15L 25R
#66 4L 55R
bar layer 5 #70 10L 12R
#73 13L 21R
#79 10L 14R

6	89.48	0.00	89.48	1.687
7	0.00	0.00	0.00	0.000

proton kinetic energy = 450.00 MeV
proton momentum = 1023.20 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	450.00	420.55	29.45	1.956
1in Plastic	420.55	412.86	7.69	0.183
1	412.86	409.81	3.05	0.111
2	409.81	406.75	3.06	0.111
3	406.75	375.54	31.21	0.399
4	375.54	342.98	32.57	0.428
5	342.98	308.70	34.28	0.465
6	308.70	272.18	36.52	0.513
7	272.18	232.54	39.64	0.576

proton kinetic energy = 500.00 MeV
proton momentum = 1090.08 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	500.00	471.82	28.18	1.781
1in Plastic	471.82	464.53	7.29	0.165
1	464.53	461.64	2.89	0.099
2	461.64	458.75	2.89	0.100
3	458.75	429.35	29.40	0.358
4	429.35	398.99	30.36	0.380
5	398.99	367.46	31.53	0.406
6	367.46	334.50	32.96	0.437
7	334.50	299.72	34.79	0.476

proton kinetic energy = 550.00 MeV
proton momentum = 1155.25 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	550.00	522.84	27.16	1.638
1in Plastic	522.84	515.86	6.98	0.150
1	515.86	513.10	2.76	0.091
2	513.10	510.33	2.77	0.091
3	510.33	482.33	28.00	0.325
4	482.33	453.61	28.72	0.342
5	453.61	424.05	29.56	0.361
6	424.05	393.50	30.55	0.384
7	393.50	361.74	31.76	0.411

proton kinetic energy = 750.00 MeV
proton momentum = 1403.53 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	750.00	725.38	24.62	1.252
1in Plastic	725.38	719.19	6.19	0.113
1	719.19	716.74	2.44	0.068
2	716.74	714.30	2.45	0.068
3	714.30	689.68	24.61	0.243
4	689.68	664.76	24.92	0.250
5	664.76	639.51	25.25	0.258
6	639.51	613.92	25.60	0.267
7	613.92	587.93	25.98	0.277

proton kinetic energy = 800.00 MeV
proton momentum = 1463.29 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	800.00	775.78	24.22	1.185
1in Plastic	775.78	769.72	6.07	0.106
1	769.72	767.33	2.39	0.064
2	767.33	764.93	2.39	0.064
3	764.93	740.86	24.07	0.229
4	740.86	716.55	24.32	0.235
5	716.55	691.96	24.59	0.242
6	691.96	667.07	24.89	0.249
7	667.07	641.85	25.22	0.257

proton kinetic energy = 850.00 MeV
proton momentum = 1522.35 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
17 mm Pb	850.00	826.13	23.87	1.125
1in Plastic	826.13	820.17	5.95	0.101
1	820.17	817.82	2.35	0.060
2	817.82	815.48	2.35	0.061
3	815.48	791.87	23.60	0.217
4	791.87	768.06	23.81	0.222
5	768.06	744.02	24.04	0.228
6	744.02	719.74	24.28	0.234
7	719.74	695.19	24.55	0.241

proton kinetic energy = 900.00 MeV
proton momentum = 1580.79 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang

problems, even if it helps with the low energy
rates. First, it is a 2.5% absolute efficiency loss, but it is actually a 6% count rate loss, since the detector is only 40% efficient. More important, I
think, is that it will spoil the position resolution, because the neutrons that scatter in this inactive layer will have indetermined position
and kinematics when they are detected eventually. Although I haven't done any detailed calculations, I think it would be better to use a few
mm of Al instead. First, Al has 2.5 times the density of plastic, so it can be that much thinner. Also, if the low
energy background is gammas and electrons, the higher Z of Al helps at least as another factor of 2-2.5, so perhaps a 1/4 inch Al or so will do
the same as the plastic, with fewer drawbacks. Using Al after lead is common as a way of reducing Compton and other backgrounds in low
energy gamma-spectroscopy. 1/4" Al weighs 110 lb, not very different from the 80 lb weight of the plastic.

User name mitchell

Log entry time 18:37:35 on June 27,1998

Entry number 6063

Followups:

6079 06/27/98 22:20 cowley anode currents on neutron detectors at nominal luminosity
6333 06/30/98 12:51 Rondon N detector, plastic, shielding, PMT currents

keyword=anode currents at nominal lum

Anode Currents in the original shielding configuration
at the experimental luminosity --- 3cm CH target and 100 nA
current

First veto layer -- --50 micro Amps (Ave of 4 left tubes)
Second veto layer ---45 micro Amps (Ave of 3 left tubes)
First Bar layer -----70 micro Amps (Ave of 4 left tubes)
Second Bar layer --- 50 micro Amps (Ave of three left tubes)
Third Bar layer ---- 25 micro Amps (Ave of three left tubes)
Fourth Bar layer ---- 25 micro Amps (Ave of three left tubes)
Fifth Bar Layer ---- 15 micro Amps (Ave of three left tubes)

User name cowley

6th plane only: 0.38 MHz
7th plane only: 0.17 MHz

User name cdaq

Log entry time 07:42:26 on July 19, 1998

Entry number 6728

keyword=ndet annode currents
Measured anode currents for ndet.
Used 100nA beam and CH2 target so that have appox experimental luminosity.
Barr66R's gain is to high. See 10V signals at patch panel .

Detector	cable at patch	hv	anode current
P12R	C156	1650	30
P15R	C159	1651	22
P32R	C184	1691	21
P36R	C180	1572	20
B_9R	G409	1630	30
B12R	G412	1576	52
B20R	G420	1696	16
B29R	G429	1657	15
B33R	I513	1572	19
B40R	I520	1662	12
B26R	I526	1591	18
B61R	I542	1560	13
B66R	I547	1566	35
B74R	I555	1591	10
B78R	I559	1540	9

User name Rondon

Log entry time 12:51:59 on June 30,1998

Entry number 6333

This entry is a followup to: 6063

keyword=N detector, plastic, shielding, PMT currents

I am somewhat concerned that the 1" plastic layers before the paddles may be a source of

17 mm Pb	900.00	876.42	23.58	1.072
1in Plastic	876.42	870.56	5.86	0.096
1	870.56	868.25	2.31	0.057
2	868.25	865.94	2.31	0.058
3	865.94	842.74	23.20	0.206
4	842.74	819.36	23.38	0.211
5	819.36	795.80	23.57	0.216
6	795.80	772.02	23.78	0.221
7	772.02	748.02	24.00	0.227

User name gwarren
Log entry time 11:34:02 on September 16, 1998
Entry number 9097
keyword=Fiducials Points for Ndet

On the floor of the ndet shielding hut are four lines to help align the detector. One each line is a fiducial point with a known distance to the target. These lines and points are not necessarily where the ndet sat or will sit

Nominal Q2 (GeV2/c2)	Theta_Q(deg)	Distance to Fiducial (cm)
0.50	61.59	274.7
1.00	54.47	274.7
1.50	49.47	474.8
1.83	45.75	724.8

User name Jechiel

Log entry time 15:25:07 on September 8,1998

Entry number 8805

keyword=N-detector shielding

Attach 2 lead 'curtains' on the sides of the n-detector.
Each curtain consists of 3 sheets (~2.5 mm thick).
They protect mainly the PM's and the bases

Note the curtains do not overlap the lead shielding
of the n-det, and there is still about a 10 cm gap between
the curtains and the main shielding (separated by the frame
structure).

One may improve it by replacing the curtains and make them wider so they reach the main shielding. (They should be then mounted from behind the top holding frame).

User name mitchell

Log entry time 12:54:03 on August 29,1998

Entry number 8354

Followups:

8369 08/30/98 02:25 Lung HMS Magnet settings

keyword=HMS startup, shielding changes

1) Started up HMS P_cen = -2.452 GeV/c, QElastic at approx 0 % delta.
2) Changed helium botle for dump and changed Argon bottles for HMS chambers.
THE ETHANE may NEED changing later today.
3) All HV seem to be OK.
4) Note that during the down time the shielding configuration of the neutron detector was changed. Previously we had 1 inch plastic + 4 sheets Pb (2.5 to 3 mm each sheet) + 0.25 inch Aluminum. The New configuration is
1 inch Plastic + 6 sheets Pb and zero Aluminum.
5) In addition to the changes in the direct shielding of the detector discussed in entry "4)" of this hclog we also replaced the front two roof beams of the ndetector hut and added two concrete blocks which narrow the solid angle of the hut entrance. These blocks are stacked at the right hand side of the ndetector when looking at the target from the ndetector position.

User name mitchell

Log entry time 17:09:07 on August 22,1998

Entry number 8179

keyword=shift summary

1) Analysed data from last night. It appears that our shielding change helped things by only a few percent at best. I am dissapointed :(
2) Long problem with the target VXI computer. Chris managed to get us going again with CAMAC. My (admittedly limited) undersatnding is that the hard drive

1	829.70	827.36	2.34	0.060
2	827.36	825.02	2.34	0.060
3	825.02	801.50	23.52	0.214
4	801.50	777.78	23.72	0.220
5	777.78	753.83	23.94	0.226
6	753.83	729.65	24.18	0.232
7	729.65	705.21	24.44	0.238

proton kinetic energy = 900.00 MeV
proton momentum = 1580.79 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	900.00	888.92	11.08	0.711
1/4in Al	888.92	885.82	3.10	0.128
1in Plastic	885.82	879.98	5.84	0.095
1	879.98	877.67	2.30	0.057
2	877.67	875.37	2.30	0.057
3	875.37	852.24	23.13	0.204
4	852.24	828.94	23.30	0.209
5	828.94	805.45	23.49	0.214
6	805.45	781.76	23.69	0.219
7	781.76	757.85	23.91	0.225

User name gwarren

Log entry time 08:01:01 on July 19,1998

Entry number 6729

keyword=ndet Singles Rate

Measured ndet singles rates for 100 nA on CH2 target with approximate experimental luminosity. Paddle thresholds at 20 mV and Bar thresholds at 50 mV.

all paddles on: 9.5 MHz
all bars on: 1.9 MHz

1st plane only: 10.0 MHz
2nd plane only: 5.5 MHz
3rd plane only: 1.1 MHz
4th plane only: 0.54 MHz
5th plane only: 0.50 MHz

1	526.71	523.98	2.74	0.089
2	523.98	521.23	2.74	0.089
3	521.23	493.49	27.75	0.319
4	493.49	465.06	28.42	0.335
5	465.06	435.85	29.21	0.353
6	435.85	405.71	30.14	0.375
7	405.71	374.46	31.25	0.400

proton kinetic energy = 750.00 MeV
proton momentum = 1403.53 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	750.00	738.44	11.56	0.831
1/4in Al	738.44	735.17	3.27	0.150
1in Plastic	735.17	729.00	6.17	0.112
1	729.00	726.57	2.43	0.067
2	726.57	724.13	2.44	0.067
3	724.13	699.63	24.50	0.240
4	699.63	674.84	24.79	0.247
5	674.84	649.72	25.12	0.255
6	649.72	624.27	25.45	0.263
7	624.27	598.45	25.82	0.273

proton kinetic energy = 800.00 MeV
proton momentum = 1463.29 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	800.00	788.63	11.37	0.787
1/4in Al	788.63	785.43	3.20	0.142
1in Plastic	785.43	779.39	6.04	0.105
1	779.39	777.01	2.38	0.063
2	777.01	774.62	2.38	0.063
3	774.62	750.65	23.97	0.226
4	750.65	726.43	24.21	0.233
5	726.43	701.96	24.48	0.239
6	701.96	677.20	24.76	0.246
7	677.20	652.11	25.09	0.254

proton kinetic energy = 850.00 MeV
proton momentum = 1522.35 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	850.00	838.78	11.22	0.747
1/4in Al	838.78	835.64	3.14	0.135
1in Plastic	835.64	829.70	5.93	0.100

for the VXI computer failed.
3) Took carbon data for false asymmetry test. Plotted numbers from the gen******.txt files. Pretrig asymmetry is generally very small (a few 10-5).
Trig asymm is bigger, (a few 10-4), not a problem. I think that we will take a test at higher reversal rate on monday.
4) On a related note I looked at the template file to investigate the NOT BUSY charge scaler. The hardware is labeled as BCM2 but the
template files were using
BCM1. Unfortunately this is not the only problem. The numbers for the
BCM2 dot NOT BUSYin the files still do not make sense (that is the ratio
of the BCM2 charge to he BCM2 dot NOT BUSY is not the live time). However
the clock and clock dot NOT BUSY clock does yield the livetime in ratio.
Something goes wrong that I do not understand.

User name cdaq

Log entry time 22:35:46 on August 21, 1998

Entry number 8136

keyword=Run 21549: polarized beam 85 nA Carbon tgt sR=OFF fR=0.5 mm

Run #21549 (mainseq) - /cdaqs1/data1/gen98_21549.log
polarized beam 85 nA Carbon tgt sR=OFF fR=0.5 mm
checking beam position and N-det, HMS operations
after all day hall access for shielding

User name gwarren

Log entry time 12:51:09 on August 20, 1998

Entry number 8040

keyword=Paddle Proton Efficiencies for different TDC starts
Did several runs with a delayed TDC gate. Used ND3 target with BCM2~75 nA (BCM1 ~ 60 nA). I get the following rates and efficiencies.

Run Number	TDC Start Delay	P14(L/R) Rates	Plane 1 Efficiency	Plane 2 Efficiency
21475	0	475/521 kHz	93.1	96.9
21478	+10 ns	467/519 kHz	94.4	97.1
21476	+20 ns	490/544 kHz	94.3	96.9
21477	+25ns	503/559 kHz	95.9	97.7

Compared to run 21311 (see entry 7992), the rates are about 12% lower for nominally same current. Difference could be due to shielding and/or to shorter pulse widths.

We see a small improvement in the efficiency by moving the TDC start to a later time. However, it is not possible to use the +25 ns delay because some channels are too close to the TDC start. At this point, I do not see a motivation to add delay to the early channels so that we can make the TDC start more then +10 ns.

At +10 ns, this shielding, current, HV and target, we have a total proton inefficiency of 0.2% in front of Bar 7.

If anyone would like to do a similar analysis, you will need barcut.kumac and barcut.f in ~gwarren/gen/replay. Note that you have to check the meantime cut!

User name mitchell

Log entry time 10:19:59 on August 20,1998

Entry number 8033

keyword=shielding on skyhook

Looked at rates in run 21472 ND3 target , 62.4 nA beam current, shielding blocking HMS deck vs
run 21386 ND3 target, 84.32 nA beam current, before shielding

After adjusting for current there is at most a 5 percent improvement.

User name markowitz

Log entry time 08:05:58 on August 20,1998

Entry number 8023

keyword=shift summary

Hall C was in access at the begginning of the shift to solve a problem with ROC2 and DAQ (see Zeier's note). We came out at 2 am after giving up on ROC 2 and ran without HMS wire chambers. DAQ continued giving problems, but we were able to do a test of the new shielding.

1	268.71	264.88	3.84	0.165
2	264.88	261.01	3.87	0.167
3	261.01	220.21	40.79	0.599
4	220.21	173.96	46.26	0.703
5	173.96	117.16	56.79	0.880
6	117.16	8.48	108.68	1.292
7	8.48	0.00	8.48	*******

proton kinetic energy = 450.00 MeV
proton momentum = 1023.20 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	450.00	436.24	13.76	1.300
1/4in Al	436.24	432.27	3.98	0.239
1in Plastic	432.27	424.67	7.59	0.178
1	424.67	421.67	3.01	0.108
2	421.67	418.65	3.02	0.109
3	418.65	387.90	30.75	0.388
4	387.90	355.90	32.00	0.416
5	355.90	322.34	33.56	0.450
6	322.34	286.78	35.57	0.493
7	286.78	248.50	38.28	0.549

proton kinetic energy = 500.00 MeV
proton momentum = 1090.08 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	500.00	486.82	13.18	1.184
1/4in Al	486.82	483.03	3.79	0.217
1in Plastic	483.03	475.81	7.22	0.161
1	475.81	472.95	2.86	0.097
2	472.95	470.09	2.86	0.098
3	470.09	441.02	29.06	0.350
4	441.02	411.06	29.96	0.371
5	411.06	380.02	31.04	0.395
6	380.02	347.66	32.36	0.424
7	347.66	313.65	34.01	0.460

proton kinetic energy = 550.00 MeV
proton momentum = 1155.25 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	550.00	537.28	12.72	1.088
1/4in Al	537.28	533.63	3.64	0.198
1in Plastic	533.63	526.71	6.92	0.148

Entry number 6837

keyword=Proton Energy losses in ndet

Proton energy losses in ndet. This time includes shielding thicknesses. One can also find the text file at ~gwarren/gen/peloss.txt.

proton kinetic energy = 200.00 MeV
proton momentum = 644.44 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	200.00	178.68	21.32	2.748
1/4in Al	178.68	172.07	6.61	0.550
1in Plastic	172.07	158.87	13.19	0.421
1	158.87	153.47	5.40	0.272
2	153.47	147.93	5.54	0.282
3	147.93	80.20	67.73	1.029
4	80.20	0.00	80.20	1.881
5	0.00	0.00	0.00	0.000
6	0.00	0.00	0.00	0.000
7	0.00	0.00	0.00	0.000

proton kinetic energy = 250.00 MeV
proton momentum = 729.13 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	250.00	231.45	18.55	2.226
1/4in Al	231.45	225.86	5.59	0.429
1in Plastic	225.86	214.92	10.94	0.325
1	214.92	210.52	4.40	0.203
2	210.52	206.06	4.46	0.208
3	206.06	157.25	48.80	0.748
4	157.25	94.19	63.07	0.970
5	94.19	0.00	94.19	1.603
6	0.00	0.00	0.00	0.000
7	0.00	0.00	0.00	0.000

proton kinetic energy = 300.00 MeV
proton momentum = 808.06 MeV/c

Plane	Inc Eng	Final Eng	delE	MS ang
8 mm Pb	300.00	283.27	16.73	1.879
1/4in Al	283.27	278.31	4.96	0.355
1in Plastic	278.31	268.71	9.60	0.267

With 75 nA (nominally) and the full ND3 target we had about 170 Hz event
rate. With the hole target we had 40 Hz. This may indicate that the events are mostly now coming from the target, i.e., the new shielding is
efficacious.
DAQ continued giving problems. At 7 am we paged SAW who found nothing obvdiously wrong. We tried again and found we can now take
data with all ROCs. Presently we are taking data onthe ND3 target. [It may be worthwhile to repeat the hole target run with the wire chambers
to be sure that the events are good events.

User name Hauger

Log entry time 07:26:44 on August 20,1998

Entry number 8022

keyword=coinc-rates

With shielding the hole- target rate is 40 Hz coincidence rate.
With ND3 in the rate is 180. All measured with 75nA BCM2.

User name gwarren

Log entry time 00:20:31 on August 20, 1998

Entry number 7992

Followups:

7993 08/20/98 00:38 gwarren Paddle Proton Efficiencies

keyword=Paddle Efficiencies
Investigated Paddle efficiencies for detecting protons. I required a cut on the meantime and the sqrt(adcn*adcp) on B7 (3:7) and looked at
the tdcs and adcs in the paddles. I found that paddles 1:7, 1:8, 1:9, 2:2 and 2:3 were hit. I then included the same meantime cut on the
paddles as I did on 3:7. The sqrt(ADCn*ADCp) spectrum for the paddles looked like a proton peak with no counts below channel 1000,
typically. Then I looked at the two-out-of-three efficiency. For plane 1 this is defined as:

efficiency(plane 1) = 1*2*B / (1*2*B + (NOT 1)*2*B)

where

1 = did 1:7 or 1:8 or 1:9 fire
2 = did 2:2 or 2:3 fire
B = did 3:7 fire

I examined three runs, 21311, 21314 and 21398. Results below:

Run Number	Target	Threshold	Current(BCM1)	P14(L/R)Rate	plane 1 efficiency	plane 2
21311	ND3	30 mV	61.7 nA	534/587 kHz	90.7%	94.9%
21314	ND3	60 mV	52.5 nA	260/273 kHz	95.0%	97.1%
21398	hole	30 mV	~76 nA	147/168 kHz	96.8%	98.0%

Conclusions: See a rate dependent inefficiency => deadtime concerns. Need to improve efficiency. We are not too incredibly far off in our
efficiencies.
User name mitchell

Log entry time 17:51:38 on August 19,1998

Entry number 7963

keyword=dorking with shielding

Installed a new Pb wall between the nuetron detecor and the HMS deck. This is to test idea that the source is secondaries from downward bent particles splashing on the metal deck of HMS. The wall is hung from the crane and Paul Hood has the key to the crane. Further the crane circuit breaker is shut off at the wall.

User name ent

Log entry time 00:45:09 on August 19,1998

Entry number 7934

keyword=shift summary

Pretty useless shift, no polarized beam , so we wanted to do some checkout with unpolarized beam, however daq did not really cooperate.

Did two runs for HMS optics. +5% momentum with and without sieve slit.

User name Zhuhg

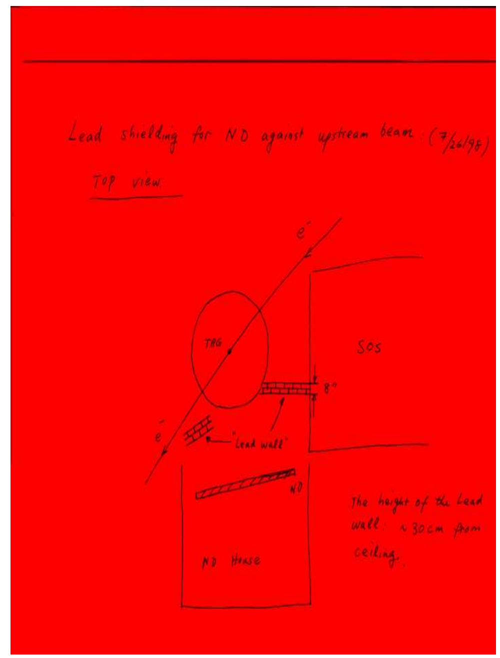
Log entry time 17:32:41 on July 26,1998

Entry number 7026

keyword=Sketch: Lead brick shielding for ND against upstream beam

Lead brick wall for neutron detector against upstream beam built
on 7/26/98:

FIGURE 1



User name gwarren

Log entry time 11:52:07 on July 23,1998

B46R	I526	1641	16
B61R	I542	1603	13
B66R	I547	1516	13
B74R	I555	1617	10
B78R	I559	1575	13
New Counters			
P4R	C148	1708	42
P5R	C149	1801	42
B4R	G404	1652	48
B5R	G405	1651	47

User name mitchell
Log entry time 22:57:20 on July 31,1998
Entry number 7109

keyword=Post shielding anode currents

After adding extensive shielding we try again.
I_ave approx 60 nA (BCM1)

P14R + P14L 560 kHz

B14R + B14L 127 kHz

P14R anode current 60 muA
P14L anode current ?
B14R anode current 45
B14L anode current 45
All with7 Empty target

User name gwarren

Log entry time 00:11:39 on July 27,1998

Entry number 7040

keyword=Swing Shift Summary

Completed assembly of lead wall on either side of target on ndet side.

Conducted some rate tests on the ndet to see effect of shielding. See roughly a reduction of 50% in paddle and bar rates. Not good enough

What we "accomplished": run with lead to shield off direct line from target indicates that we obtain only small reduction (30%) in neutron det.
rates. That seems to indicate most of the rate is coming from downstream the target, pretty consistent with the end of july findings that the ndet
rates were vastly varying between CH2(no chicane), CH2(chicane), and hole(chicane) (see end of july).
Lead is removed now again.
Tried to take some calibration runs in HMS at 2.0 GeV/c, with defocused (*1.20) Q2 setting, impossible to take large run since the event
recorder kept crashing, despite having Marko here all of the shift. However, we noted that the sumtdc spectra in HMS, and some adc spectra,
looked very weird, possibly indicating a timing problem in the tdc/adc readout. Has to be checked when we have beam again.
At 10.45 pm MCC started preparing polarized beam again.

User name lourie

Log entry time 20:48:49 on August 18,1998

Entry number 7922

keyword=shielding test

On 8/18 shielding was added in front of target for testing rates in n-detector.

run tgt shielding b14 rate p14 rate
21371 ND3 No 95/114 558/626

21397 ND3 Yes 64/80 411/470

21398 hole Yes 21/27 147/168

All rate in kHz for left/right detectors, all runs at 75 nA. Conclusion: the dominant
rate is not coming directly from the target. Suspect that it's generated downsteam.

User name cdaq

Log entry time 20:29:21 on August 18, 1998

Entry number 7921

keyword=Run 21398: hole target

Run #21398 (mainseq) - /cdaqs1/data3/gen98_21398.log
hole target
lead shielding in

User name cdaq

Log entry time 20:01:11 on August 18, 1998

Entry number 7920

keyword=Run 21397: pol ND3 target

Run #21397 (mainseq) - /cdaqs1/data3/gen98_21397.log
pol ND3 target
lead shielding in

User name cdaq

Log entry time 19:51:38 on August 18, 1998

Entry number 7919

keyword=Run 21396: carbon target

Run #21396 (mainseq) - /cdaqs1/data3/gen98_21396.log
carbon target
lead shielding in

User name cdaq

Log entry time 19:31:50 on August 18, 1998

Entry number 7918

keyword=Run 21395: run with carbon tgt., lead shielding in

Run #21395 (mainseq) - /cdaqs1/data3/gen98_21395.log
run with carbon tgt., lead shielding in

User name gwarren

Log entry time 14:08:08 on August 11, 1998

Entry number 7696

keyword=ndet Rates for P14/B14 with new shielding
Looked at trigger rates for ndet with 4th sheet of lead. Normalized rates to 50 nA (according to BCM1) using Paddle rates. Paddle threshold was 20 mV. Turned on only P14 and B14, using HV of previous tests. Paddle rate was 360 kHz.

Bar Rates:

Counter	50 mV threshold	75 mV threshold	100 mV threshold
B14	105 kHz	40 kHz	24 kHz

User name gwarren

Log entry time 13:04:42 on August 11, 1998

Entry number 7694

keyword=ndet anode currents with 4th sheet of lead
Anode Currents with Carbon target, scaled to 50 nA on BCM1/59 nA on BCM2, after adding 4th layer of lead to detector shielding. I added
new counters to the list that are in the hot area for protons. I would be very happy to run at 50 nA. We could probably run at 100 nA, but we
have to expect some loss in gain in the front tubes. One solution may be to put 800 V at dinode. I need to investigate that.

Did a measurement in which dropped with HV by 50 V for P5R, P12R, B5R, B12R. Observed a drop in anode current of ~40%.

Counter	Patch	HV	Anode Current (uA)
P12R	C156	1890	65
P15R	C159	1870	45
P32R	C184	1784	27
P36R	C180	1739	27
B9R	G409	1694	38
B12R	G412	1594	36
B20R	G420	1781	28
B29R	G429	1730	23
B33R	I513	1620	23
B40R	I520	1745	18