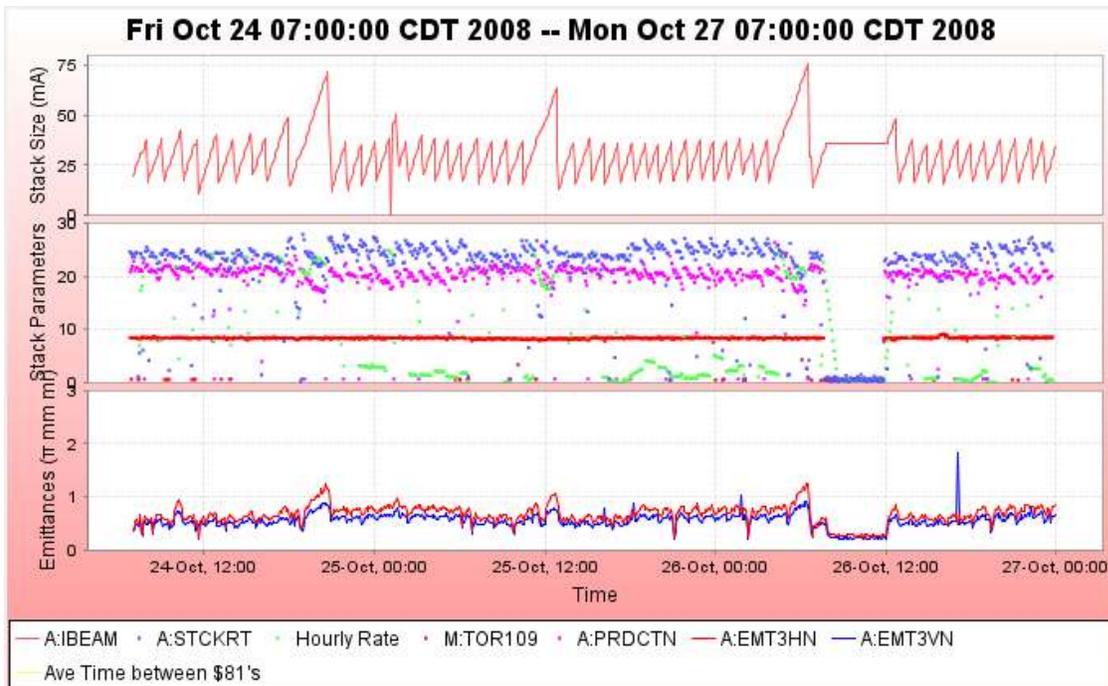


## Stacking

- Performance
  - We had a fairly good weekend of stacking.
  - Best stacking hours for the three days this weekend were  $\approx 24$  mA (unknown due to AP1001), 23.84 mA, 24.84 mA.
  - Average productions for the three days this weekend were 18.94, 18.76, 18.17 e-6/proton.
  - Stacked 1469.43 E10 in 70.2 hours.
- Some minor controls issues
  - AP1001
    - Some devices coming back through the AP1001 GPIB front end stopped updating overnight on Saturday.
    - This includes A:IBEAM.
    - The Saturday best stacking hour calculation is incorrect as a result.
    - Reboot of AP1001 fixed most of the problems.
    - The VSA was still having write errors, and required a reset.
  - Accumulator TBT BPMs
    - Some problems with reverse proton Accumulator TBT during one set of transfers.
    - The AP30 and AP60 BPM houses needed to be rebooted, which fixed the problem.
  - There was also one case where the Pbar and RR sequencers got out of synch, both waiting for the other to continue.

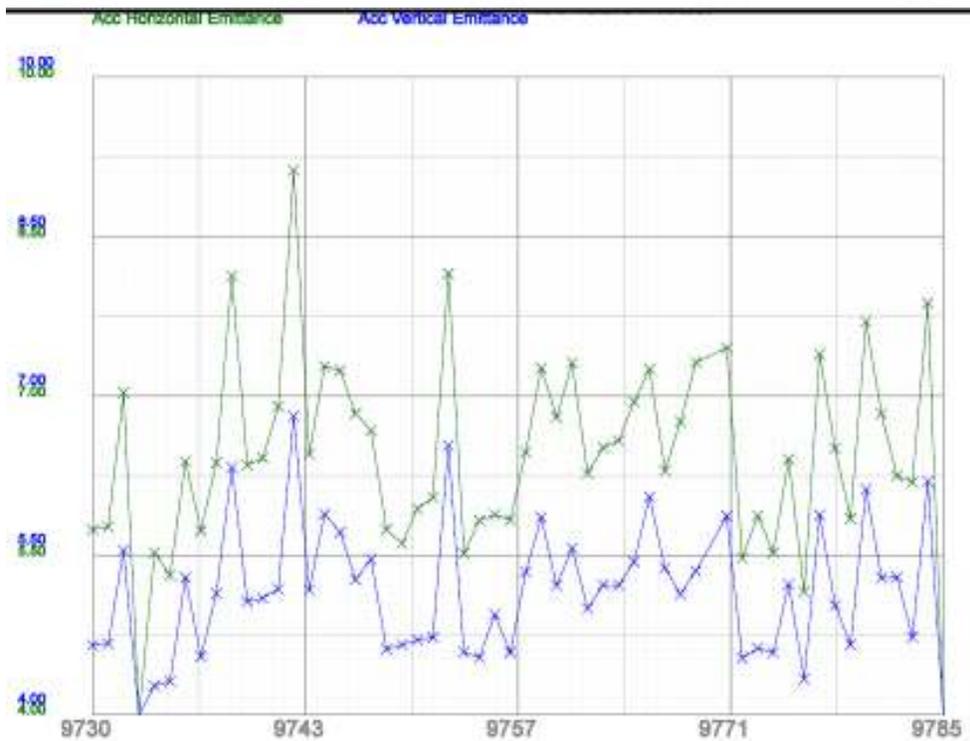
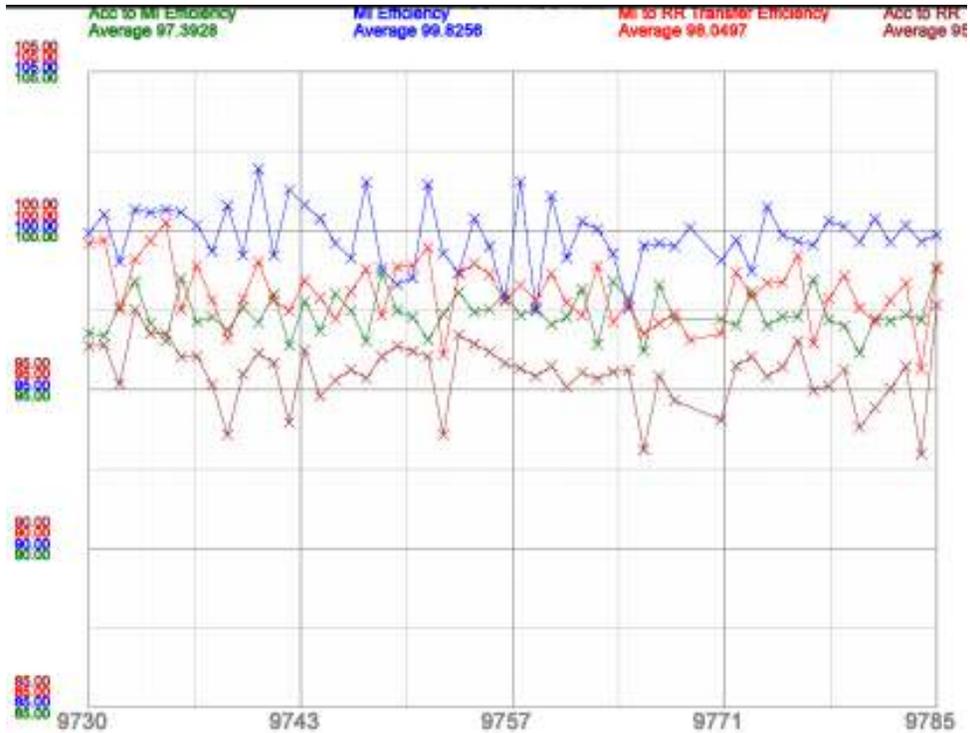


## Transfers

- Pbars sent to the Recycler: 1479.22 E10
- Number of transfers : 120
- Number of transfer sets: 56
- Accumulator to Recycler efficiency averaged approximately 95%.
- We are still 0.5 to 1.0% lower than we would like for transfers. A contributing factor

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for this may be Accumulator core emittances. It is hoped that after our access request is granted to change attenuation in the core cooling, that we can improve our emittances a bit.



Column 1 Number _0_Pbar	Column 4 Number_3_Transfer Time	Column 21 Number _20_A:IB	Unstacked (mA)	Column 24 Number _23_R:BE	Stashed	Acc to RR Eff	Column 27 Number _26_MI DCCT SMALL	Column 28 Number _27_MI Before	Acc to MI Eff	Acc to MI2 Eff	Transfers	Sets	
	<b>Totals =&gt;</b>	7:00:00 AM	1306.16		1257.55	96.28%	1288.42	1285.98	98.64%	98.46%	107	49	
9785	Monday, October 27, 2008	5:47:50 AM	38.12	28.73	95.09	28.07	97.70%	28.41	28.38	98.89%	98.78%	2	1
9784	Monday, October 27, 2008	4:00:42 AM	70.35	64.35	67.52	59.28	92.12%	62.18	62.13	96.62%	96.55%	4	1
9783	Monday, October 27, 2008	1:14:01 AM	38.28	25.96	358.47	24.83	95.64%	25.28	25.30	97.37%	97.43%	2	1
9782	Monday, October 27, 2008	12:10:30 AM	37.83	24.52	335.41	23.28	94.94%	23.80	23.72	97.05%	96.75%	2	1
9781	Sunday, October 26, 2008	11:08:39 PM	37.39	23.33	313.61	22.02	94.38%	22.68	22.78	97.21%	97.64%	2	1
9780	Sunday, October 26, 2008	10:15:36 PM	38.30	21.76	292.49	20.39	93.74%	20.92	20.86	96.17%	95.87%	2	1
9779	Sunday, October 26, 2008	9:13:05 PM	38.70	25.33	272.78	24.23	95.66%	24.58	24.58	97.06%	97.04%	2	1
9778	Sunday, October 26, 2008	8:08:00 PM	38.90	24.69	249.29	23.48	95.11%	24.03	24.03	97.30%	97.30%	2	1
9777	Sunday, October 26, 2008	7:01:53 PM	37.53	21.83	226.44	20.72	94.92%	21.48	21.37	98.39%	97.90%	2	1
9776	Sunday, October 26, 2008	6:02:23 PM	36.29	21.69	206.17	20.93	96.52%	21.13	21.05	97.41%	97.08%	2	1
9775	Sunday, October 26, 2008	5:05:32 PM	38.23	22.08	185.67	21.12	95.64%	21.48	21.44	97.28%	97.10%	2	1
9774	Sunday, October 26, 2008	3:58:18 PM	37.02	23.26	164.91	22.18	95.36%	22.55	22.72	96.96%	97.69%	2	1
9773	Sunday, October 26, 2008	2:54:18 PM	35.64	22.32	142.98	21.41	95.92%	21.92	21.62	98.22%	96.86%	2	1
9772	Sunday, October 26, 2008	1:56:26 PM	38.57	24.22	121.79	23.18	95.72%	23.53	23.48	97.16%	96.94%	2	1
9771	Sunday, October 26, 2008	12:45:52 PM	49.33	36.80	98.83	34.50	93.77%	35.71	35.47	97.06%	96.40%	3	1
9769	Sunday, October 26, 2008	6:35:41 AM	75.44	44.17	64.92	57.89	131.07%	60.18	60.28	136.26%	136.48%	2	1

9768	Sunday, October 26, 2008	3:40:10 AM	37.23	22.74	367.95	21.48	94.46%	22.11	21.96	97.21%	96.54%	2	1
9767	Sunday, October 26, 2008	2:43:28 AM	36.37	21.77	348.68	20.76	95.36%	21.39	21.32	98.26%	97.92%	2	1
9766	Sunday, October 26, 2008	1:46:45 AM	38.63	21.48	329.54	19.98	93.04%	20.64	20.51	96.13%	95.51%	2	1
9765	Sunday, October 26, 2008	12:47:06 AM	37.21	22.36	310.85	21.37	95.55%	21.88	21.39	97.84%	95.65%	2	1
9764	Saturday, October 25, 2008	11:50:35 PM	36.19	21.42	290.64	20.47	95.59%	21.04	20.91	98.23%	97.62%	2	1
9763	Saturday, October 25, 2008	10:58:29 PM	38.39	23.14	270.91	22.06	95.33%	22.35	22.33	96.58%	96.51%	2	1
9762	Saturday, October 25, 2008	9:59:35 PM	38.63	23.65	249.63	22.59	95.53%	23.23	23.27	98.23%	98.42%	2	1
9761	Saturday, October 25, 2008	8:55:55 PM	36.60	21.00	227.73	19.95	94.99%	20.44	20.26	97.32%	96.49%	2	1
9760	Saturday, October 25, 2008	7:59:25 PM	36.33	21.90	208.19	20.97	95.73%	21.25	21.51	97.04%	98.22%	2	1
9759	Saturday, October 25, 2008	7:09:31 PM	37.30	21.01	187.67	20.03	95.37%	20.45	19.95	97.36%	94.96%	2	1
9758	Saturday, October 25, 2008	6:12:17 PM	36.53	22.33	167.97	21.35	95.65%	21.73	22.03	97.31%	98.66%	2	1
9757	Saturday, October 25, 2008	5:11:27 PM	36.12	22.58	146.85	21.65	95.88%	22.11	21.67	97.95%	95.97%	2	1
9756	Saturday, October 25, 2008	4:10:32 PM	36.07	22.19	125.47	21.33	96.13%	21.62	21.53	97.43%	97.04%	2	1
9755	Saturday, October 25, 2008	3:11:38 PM	38.56	24.60	104.35	23.71	96.39%	23.97	24.12	97.44%	98.03%	2	1
9754	Saturday, October 25, 2008	2:03:34 PM	37.11	23.94	80.84	23.16	96.73%	23.50	23.19	98.18%	96.88%	2	1
9753	Saturday, October 25, 2008	12:48:48 PM	62.66	53.65	57.98	49.98	93.17%	52.16	51.87	97.22%	96.69%	4	1
9752	Saturday, October 25, 2008	10:23:31 AM	36.37	22.74	359.90	21.84	96.02%	21.95	22.22	96.50%	97.71%	2	1
9751	Saturday, October 25, 2008	9:18:31 AM	37.04	23.12	339.52	22.24	96.20%	22.47	22.16	97.21%	95.86%	2	1
9750	Saturday, October 25, 2008	8:15:32 AM	36.89	23.31	318.50	22.43	96.23%	22.70	22.32	97.36%	95.75%	2	1
9749	Saturday, October 25, 2008	7:13:34 AM	38.08	24.23	297.05	23.26	95.99%	23.88	23.59	98.54%	97.35%	2	1
9748	Saturday, October 25, 2008	6:06:52 AM	37.14	22.58	274.64	21.53	95.32%	21.79	22.14	96.48%	98.06%	2	1
9747	Saturday, October 25, 2008	5:11:06 AM	38.54	23.50	253.79	22.46	95.57%	22.91	22.75	97.48%	96.79%	2	1
9746	Saturday, October 25, 2008	4:14:36 AM	38.54	22.71	231.92	21.63	95.24%	22.25	22.15	97.99%	97.54%	2	1
9745	Saturday, October 25, 2008	3:20:17 AM	39.92	23.17	210.79	21.97	94.82%	22.47	22.49	96.97%	97.04%	2	1
9744	Saturday, October 25, 2008	2:15:41 AM	37.39	23.13	189.34	22.23	96.11%	22.62	22.83	97.82%	98.70%	2	1
9743	Saturday, October 25, 2008	1:35:19 AM	50.71	29.28	167.59	27.49	93.91%	28.22	28.57	96.39%	97.60%	2	1
9742	Saturday, October 25, 2008	12:03:32 AM	37.23	22.58	140.55	21.64	95.84%	22.11	21.94	97.92%	97.19%	2	1
9741	Friday, October 24, 2008	11:04:05 PM	35.33	21.93	119.22	21.08	96.11%	21.31	21.70	97.16%	98.96%	2	1
9740	Friday, October 24, 2008	9:58:31 PM	36.28	27.73	98.35	26.50	95.55%	27.02	26.79	97.44%	96.61%	3	1
9739	Friday, October 24, 2008	8:46:50 PM	72.57	65.05	72.31	60.37	92.81%	62.82	63.16	96.57%	97.09%	4	1

## Studies

- Put in core vertical settings based on TFM data (<http://www-bd.fnal.gov/cgi->

[mach/machlog.pl?nb=pbar08&action=view&page=455&scroll=false&load=](http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=455&scroll=false&load=)).

- The trombone and attenuation changes were put in.
- To get the correct ratio of powers on bands 1, 2 and 3, we need to add more power to the bands 2 and 3 systems. We did not have enough room in the Core Vertical bands 2 and 3 systems to raise the power to the calculated values. A short access will be needed to remove attenuation to make this possible.
- To get the correct ratio of powers on bands 1, 2 and 3, we tried lowering the power on band 1. This resulted in higher emittances, so we backed out of the changes for the weekend.

## Requests

1. **Access to remove attenuation on Core Vertical Bands 2 and 3.**
  - Access location: Pbar Rings
  - Access time: 1 hour keys to keys.
  - Access work: Remove attenuation from Core Vertical bands 2 and 3.
  - Work Crew: Pete Seifrid and Wes Mueller will be the ones making the access.
  - Post access: We will need to put in calculated values for trombones and attenuators. This can be done parasitically during stacking.
2. **Core Transverse Cooling Measurements**
  - Prerequisites:
    - The access to remove core vertical band 2 and 3 attenuation must be finished.
    - The newly calculated values must be in place for the trombones and attenuators and considered successful.
  - Beam conditions:
    - ~45mA of beam in the Accumulator.
  - Background
    - This is a repeat of the core cooling study completed first on the evening of Friday, October 3rd (See <http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=423&anchor=202716&hilite=20:27:16->), and then again on the morning of Friday, October 17th (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=441&load=>).
    - The October 3rd set of measurements were taken before the Core Vertical Equalizer was installed.
    - The October 17th set of measurements were taken after the Core Vertical Equalizer was installed. Initial indications are that maybe the cooling is worse with the new vertical equalizer.
    - Transfer function measurements made on October 13th (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=433&anchor=135730&hilite=13:57:30->) determined that the trombone for each band needed to go longer by one wavelength; however, band 2 did not have enough range. This means the measurements taken on October 17th were not with a completely optimized system.
    - Adding additional cable delay requires a tunnel access, which was completed on Wednesday, October 22nd (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=451&scroll=false&load=>).
    - After the October 22nd access was completed, a new set of Core Vertical transfer function measurements were made (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=452&anchor=193038&hilite=19:30:38->). An additional set of TFMs were made after this. Valeri calculated ideal Core Vertical trombone and attenuator settings based on these measurements. It was determined that there was not enough gain in the Core Vertical band 2 and 3 systems to fully implement the change. The systems can be modified to accommodate the change, but another tunnel access is required.
    - On Friday, October 24th, at attempt to put in the new trombone settings and put in the correct ratio of band 1, 2 and 3 gains was made (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=455&scroll=false&load=>). Since there was not enough room in bands 2 and 3, experts tried lowering band 1 in order to get the correct ratio. The results



- Most in an hour: 23.84 mA at Sun Oct 26 04:43:52 CDT 2008
- Best: 37.52 mA on 25-Oct-08
- Average Production 18.76 e-6/proton Best: 25.41 e-6/proton on 01/30/2008
- Average Protons on Target 7.38 e12 Best: 8.77 e12 on 07/24/2007
- Largest Stack .00 mA Best: 313.58 mA on 02/18/2008

- Monday

- Most in an hour: 24.84 mA at Mon Oct 27 02:17:40 CDT 2008
- Best: 37.52 mA on 25-Oct-08
- Average Production 18.17 e-6/proton Best: 25.41 e-6/proton on 01/30/2008
- Average Protons on Target 7.23 e12 Best: 8.77 e12 on 07/24/2007
- Largest Stack 71.01 mA Best: 313.58 mA on 02/18/2008

Pasted from <<http://www-bd.fnal.gov/pplot/today/PbarSummaryTables.html>>

- Al's Numbers

- Stacking

- Pbars stacked: 1469.43 E10
- Time stacking: 70.20 Hr
- Average stacking rate: 20.93 E10/Hr

- Uptime

- Number of pulses while in stacking mode: 103278
- Number of pulses with beam: 97296
- Fraction of up pulses was: 94.21%

- The uptime's effect on the stacking numbers

- Corrected time stacking: 66.14 Hr
- Possible average stacking rate: 22.22 E10/Hr
- Could have stacked: 1559.78 E10/Hr

- Recycler Transfers

- Pbars sent to the Recycler: 1479.22 E10
- Number of transfers : 120
- Number of transfer sets: 56
- Average Number of transfer per set: 2.14
- Time taken to shoot including reverse proton tuneup: 00.70 Hr
- Transfer efficiency: 94.94%

- Other Info

- Average POT : 7.71 E12
- Average production: 19.58 pbars/E6 protons

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## Elog Notes

Friday

Saturday

- AP1001

- **01:10:50-** Both the RR and Pbar sequencers hung up on reading devices (A:IBEAM, etc.), Ops rebooted the AP1001 FE, all is well.

Pasted from <<http://www-bd.fnal.gov/cgi-mcr/elog.pl?nb=2008&action=view&page=811&frame=2&anchor=&hilite=>>>

- VSA

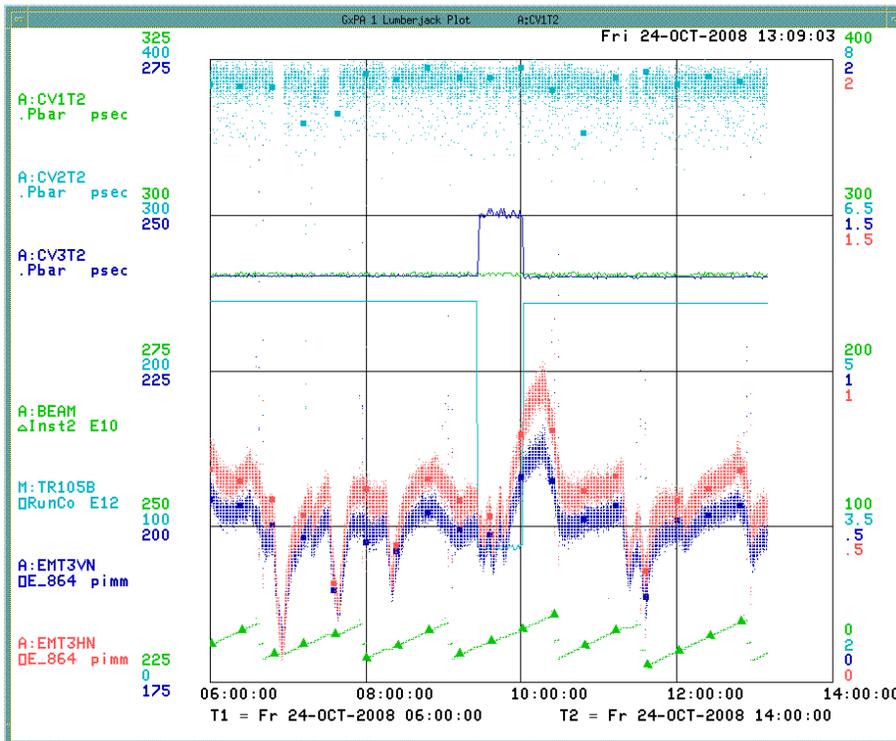
- **01:19:24-** The Pbar VSA is having write errors. This is delaying shots to RR. Ops power cycled the scope, locally.

Pasted from <<http://www-bd.fnal.gov/cgi-mcr/elog.pl?nb=2008&action=view&page=811&frame=2&anchor=&hilite=>>>

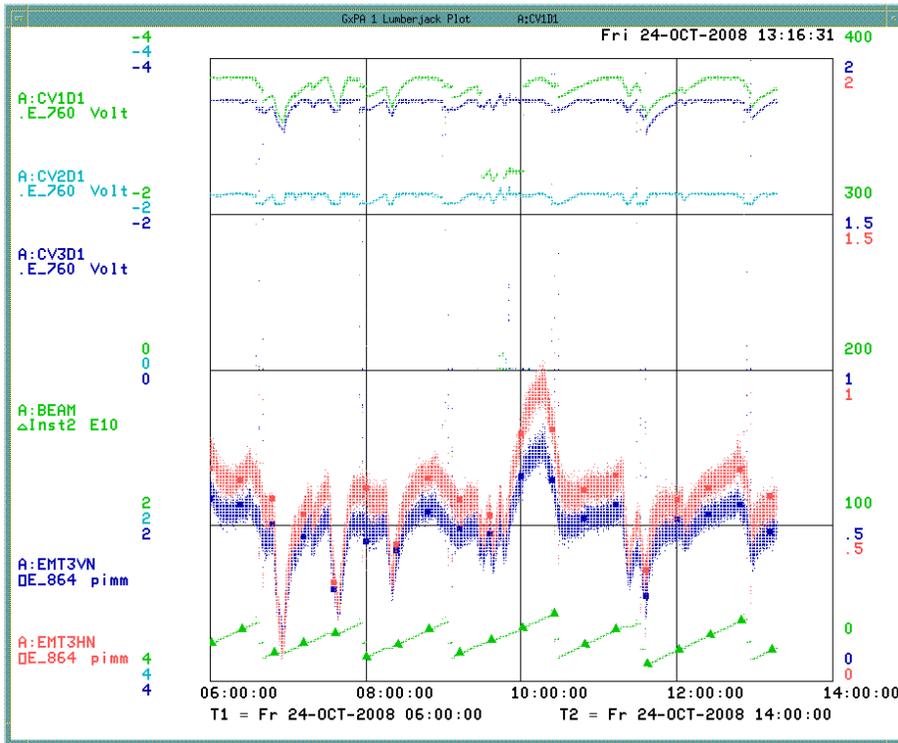
- Accumulator TBT
  - **MCR 22:04:08-** Pbar transfers (2) to RR completed. There were problems with BPMs during the Pbar reverse proton tuning, we skipped it and moved on and will look into the BPMs between transfer sets Pasted from <<http://www-bd.fnal.gov/cgi-mcr/elog.pl?nb=2008&action=view&page=813&frame=2&anchor=&hilite=>>
  - **Pbar Sat Oct 25 22:23:05-** Had a problem reading BPMs during RR transfer TBT tuneup. Ops rebooted both the AP30 and AP60 BPM houses. Pasted from <<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=last&frame=2&anchor=&hilite=&load=>>
  - **Pbar:** Displays "No Readback of Calibration Signal (Hardware Error)" Pasted from <<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=last&frame=2&anchor=&hilite=&load=>>
  - **Pbar Sat Oct 25 23:55:04-** This round of transfers worked fine, TBT looked good, no changes set out. Pasted from <<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=last&frame=2&anchor=&hilite=&load=>>
  -

▪  
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 Sunday  
 Monday

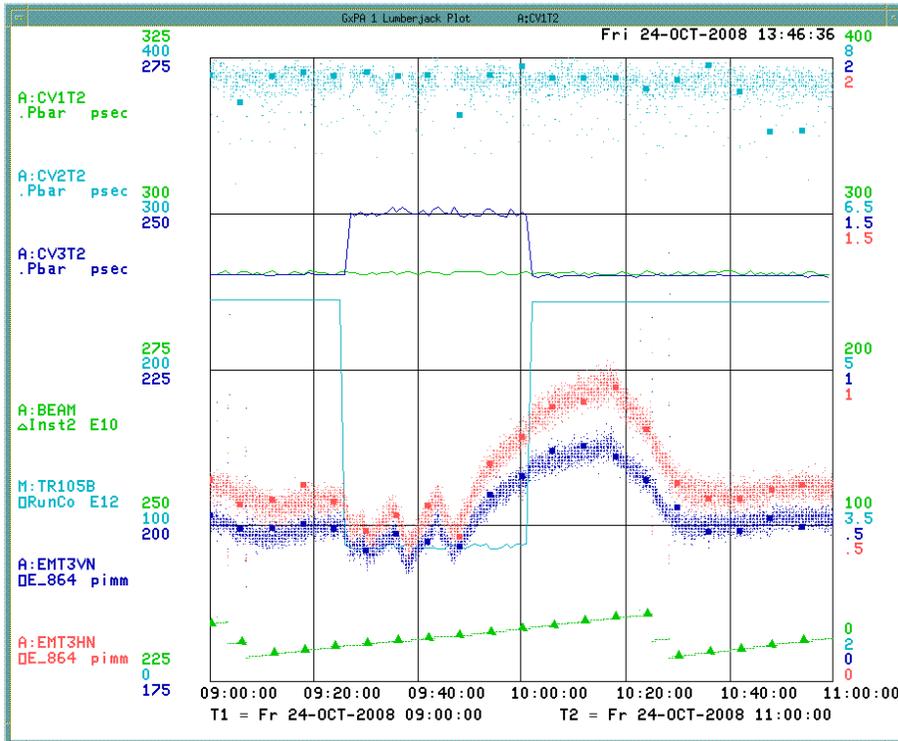
Other



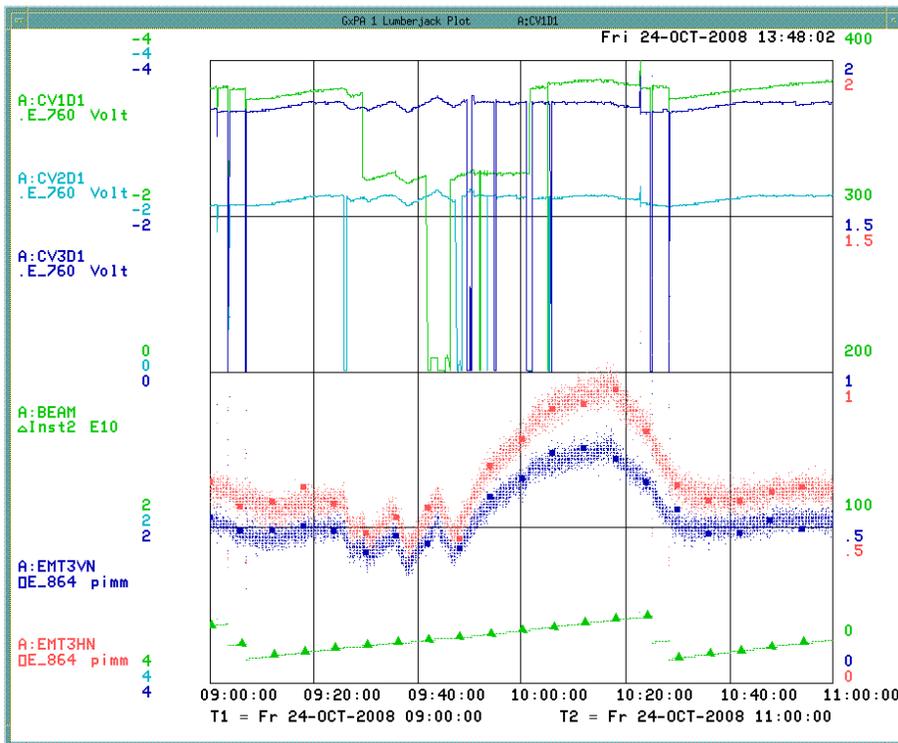
Pasted from <<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=-7818&button=yes&invert=yes>>



Pasted from <<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=-7819&button=yes&invert=yes>>



Pasted from <<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=-7823&button=yes&invert=yes>>



Pasted from <<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=-7824&button=yes&invert=yes>>

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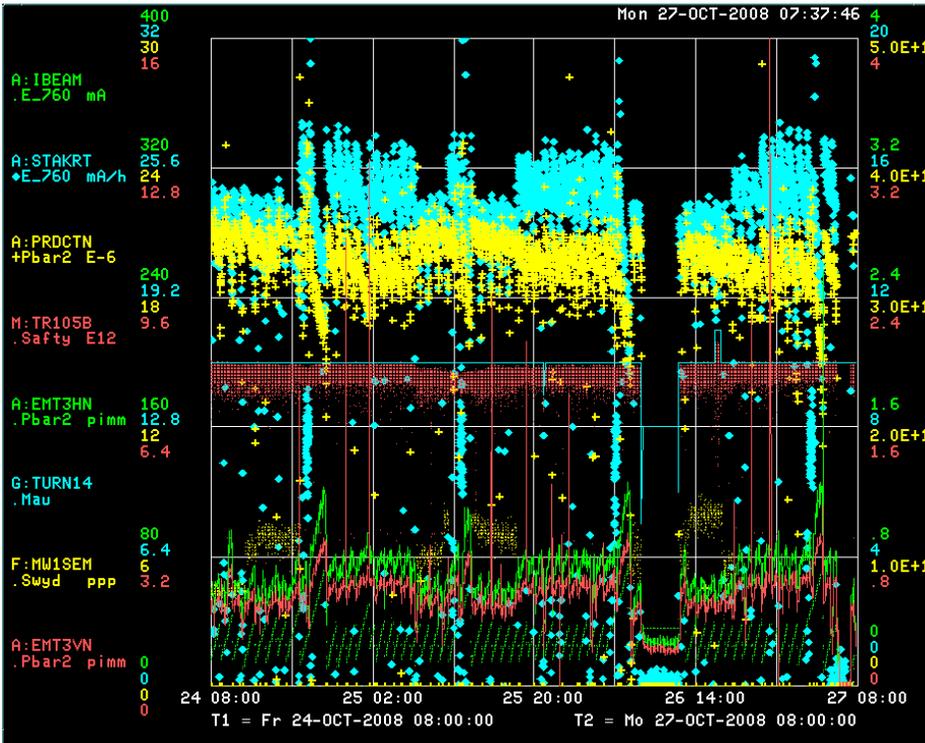
PA P51 ACCUMULATOR BPM
P51   Pbar Accumulator BPM System   25-OCT-08 22:05:15  ♦Pgm_Tools♦
-----
[ DISPLAY | PLOT | ARCHIVE | CONFIGURATION | diagnostics | calibration | injection ]
-----
Display                               Plot
*Start Data Collection/Plot            *Display ♦GxPA1♦
*Refresh Graphics Screen               *Plane ♦Vert ♦
*Display data for ♦Position ♦          *Limits ♦Position ♦
                                        Horiz Full Scale (MM) [10 ]
                                        Vert Full Scale (MM) [10 ]
*CO: Measurements to Average [ 1 ]
                                        *CO: Operation ♦Difference♦
                                        from ♦Scratch♦
State: No Data
*Real Beam mode

Archive                                 Configuration
PASSIVE - No Archiving Allowed          MODE: Turn By Turn
                                        PREAMP GAIN: Normal
                                        DC GAIN: 22.000000 dB
                                        ARM EVENT: 00
                                        TRIGGER EVENT: 00
*Display ♦GxPA2♦
*View Scratch Directory -<24>+
*Display Scratch File # [1177]
                                        *****
                                        ** RESET Control Flag **
                                        *****

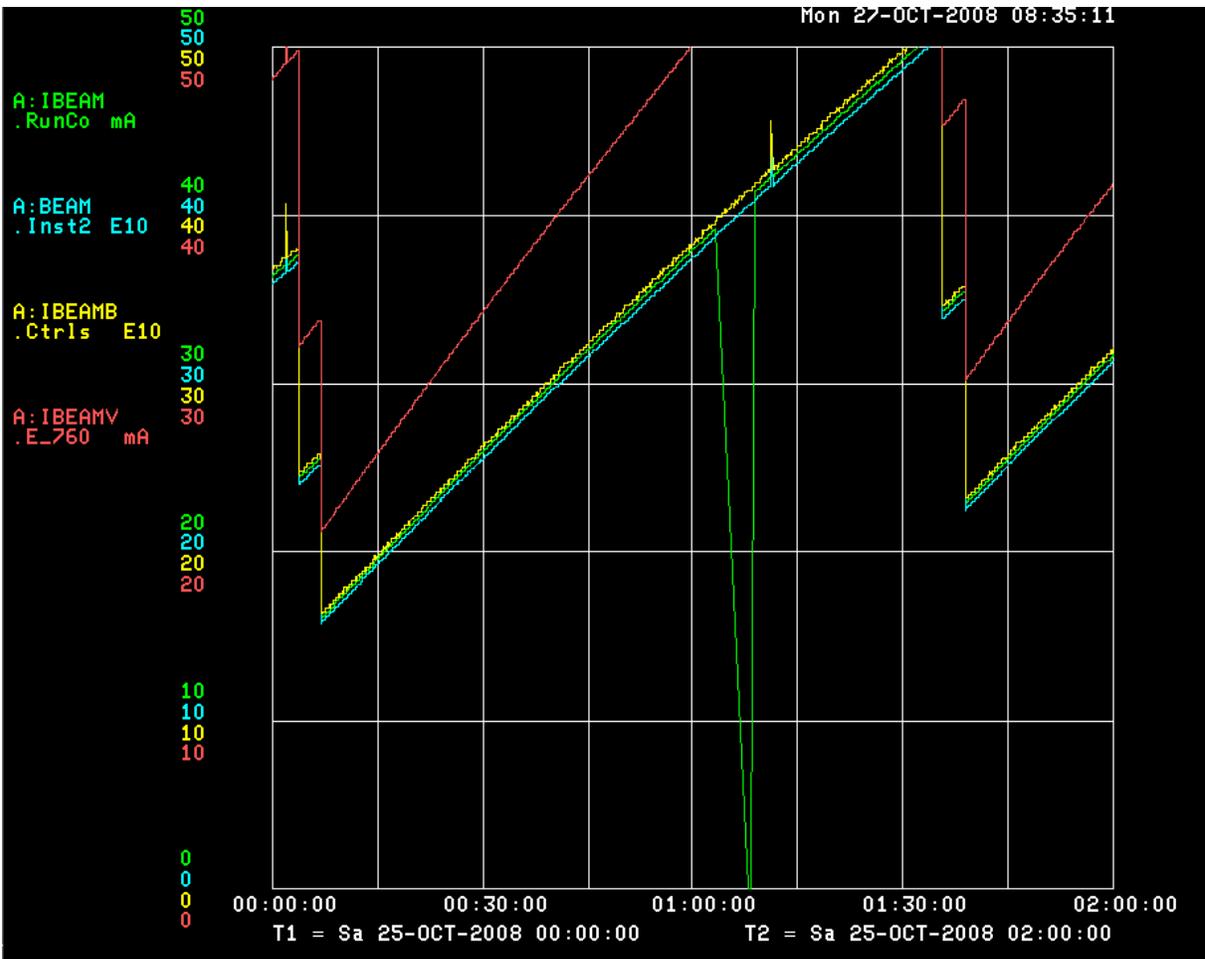
Processor State
Hw SUM ERR AP10 AP20 AP30 AP40 AP50 AP60
PROC STATE ARMD ARMD ARMD ARMD ARMD ERR
ARM EVENT OF OF OF OF OF OF OF
ARM COUNT 0 0 0 0 0 0 0
TRG EVENT 93 93 93 93 93 93
TRG COUNT 0 0 0 0 0 0

Messages
----- Initialization finished -----
Reading Accumulator Lattice Information from MAD File
Getting Device Indices and Building Device Lists
No Readback of Calibration Signal (Hardware error)
This console will only be passive
Console 1001 is running application and has set the control flag
-----
1:6 of 7
  
```

Pasted from <<http://www-bd.fnal.gov/cgi-mcr/elog.pl?nb=2008&action=view&page=-6348&button=yes&invert=no>>



Weekend Stacking



AP1001