Fast Recycler Transfers Documentation

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Send suggestions and comments to ad-pbar-tuning-adminNOSPAM@fnal.gov (remove "NOSPAM")

Sequencer: Pbar Annex

Fast Recycler Aggregate: **Fast Recycler Start**

Previous Aggregate: Fast Recycler Reverse Protons

Purpose of this Aggregate:

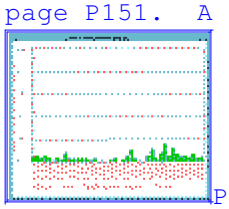
How to get back to stacking form here:

::: BEAM_SWITCH Pbar_Source Off .

::: NOTIFY Start .

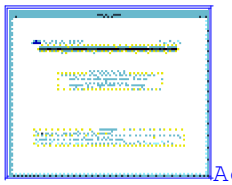
::: START_PGM SA1127 .

Pbar Radiation Detector Display (keeper is Tony Leveling)on comfort display 102. This SA can be used during the beam line tune-up to verify that radiation levels are not high enough to cause a radiation trip. The program emulates the actions of the radiation detector cards. It updates every 60 seconds and takes a 15 minutes rolling average of the radiation losses and normalizes each radiation detector so that a value of 1 corresponds to the radiation trip level. The parameters for the individual radiation detectors can be found on D106 ACC/DEB < 1> to < 3>. G:RA{####} is an integrating real-time read back of the radiation detector. Every 60 seconds, which is not concurrent with the supercycle, G:RA{####} is reset to zero and starts integrating all over again. G:RD{####} takes the number of G:RA {####} before it is reset and keeps that value until G:RA{####} is reset again. When doing the reverse proton tune-up later in the shot, if any radiation detector gets near to 1 on the plot, the beam switch should be taken to avoid a radiation trip. If the SA1127 plot dies, it can be restarted by reissuing this command, or manually through Acnet page P151. A screen capture of SA1127 is shown below.


Pbar Radiation Detector Display. Click on thumbnail to view full-sized image.

::: START_PGM P162 .

Starts the Accumulator BPM TBT Page P162 (keeper is Keith Gollwitzer). This page, as shown below, checks the status of the Accumulator BPM houses and issues resets to any house that is not online. This allows plenty of time for the BPM houses to reboot before they are need in the beam line tune-up. Upon completion, this application will self terminate and the window will close on its own.


Accumulator BPM page. Click on thumbnail to view full-sized image.

::: WAIT_FOR SECS 30 .

::: SETIT_DEVICE V:PSHOOT =1 .

::: SET_ENUMERATED V:APSMOD .

::: SET_DEVICE A:APSHOT +=1 .

```
::: ACL WAIT_FOR_READING_MATCH .
::: SET_DEVICE A:SHTNUM =0 .
::: SET_DEVICE V:CASPBT =1 .
::: SET_DEVICE V:SETPBT =1 .
::: CHECK_DEVICE A:APSHOT READING .
::: SHOT_LOG CHAPTER .
::: SHOT_LOG COMMENT .
::: CTLIT_DEVICE D:BSC925 OFF .
::: ABORT_MASK PBAR_SOFT ENABLED .
::: ABORT_MASK AP1_120_PS ENABLED .
::: ABORT_MASK AP1_8_PS DISABLED .
::: INSTRUCT 206 .
```

```
   The next steps set up the AP1 and AP3 lines for 8 GeV reverse
proton operation. Alarms are also set up.

            Interrupt anywhere in this box to continue.
```

```
::: ALARM_LIST PBAR 2 .
```

Bypasses the D59 alarm list entitled "AP1 120".

Pbar alarm list 2 after it has been bypassed by the Pbar Sequencer.. Click on thumbnail to view full-sized

```
::: SET_SEQ FILE 37 .

     M:HV100 TURN DEVICE OFF ok
     M:Q101 TURN DEVICE OFF ok
     M:Q102 TURN DEVICE OFF ok
     M:HV102 TURN DEVICE OFF ok
     M:Q103 TURN DEVICE OFF ok
     M:Q104 TURN DEVICE OFF ok
     M:Q105 TURN DEVICE OFF ok
     M:V105 TURN DEVICE OFF ok
     M:Q106 TURN DEVICE OFF ok
     M:Q107 TURN DEVICE OFF ok
     M:Q108 TURN DEVICE OFF ok
     M:Q109I TURN DEVICE OFF ok
     M:Q109V TURN DEVICE OFF ok

::: INSTRUCT 307 .
```

```
   The next steps restore AP1/3 settings from a Recycler Shots save
file. Choose SHOTS file #1149. This is the current default for
Fast Recycler Shots.

            Interrupt anywhere in this box to continue.
```

```
::: SET_SEQ FILE_SR 79 .

     M:HV200 RESTORE (D1 file) SETTING 1149 ok
     M:HT100 RESTORE (D1 file) SETTING 1149 ok
     M:HT100 RESTORE (D1 file) ANL ALARM 1149 ok
     M:Q201 RESTORE (D1 file) SETTING 1149 ok
     M:VT101 RESTORE (D1 file) SETTING 1149 ok
```

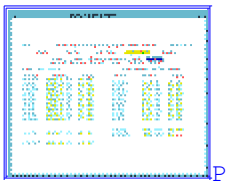
```
M:VT101 RESTORE (D1 file) ANL ALARM 1149 ok
M:VT101A RESTORE (D1 file) SETTING 1149 ok
M:VT101A RESTORE (D1 file) ANL ALARM 1149 ok
M:Q102R RESTORE (D1 file) BASIC STS 1149 ok
M:Q202 RESTORE (D1 file) SETTING 1149 ok
M:HV202 RESTORE (D1 file) SETTING 1149 ok
M:Q203 RESTORE (D1 file) SETTING 1149 ok
M:Q204 RESTORE (D1 file) SETTING 1149 ok
M:Q205 RESTORE (D1 file) SETTING 1149 ok
M:V205 RESTORE (D1 file) SETTING 1149 ok
M:HT105 RESTORE (D1 file) SETTING 1149 ok
M:HT105 RESTORE (D1 file) ANL ALARM 1149 ok
M:Q206 RESTORE (D1 file) SETTING 1149 ok
M:Q207 RESTORE (D1 file) SETTING 1149 ok
M:HT107 RESTORE (D1 file) SETTING 1149 ok
M:HT107 RESTORE (D1 file) ANL ALARM 1149 ok
M:Q208 RESTORE (D1 file) SETTING 1149 ok
M:VT108 RESTORE (D1 file) SETTING 1149 ok
M:VT108 RESTORE (D1 file) ANL ALARM 1149 ok
M:Q209 RESTORE (D1 file) SETTING 1149 ok
M:SMA1S RESTORE (D1 file) SETTING 1149 ok
M:SMA1S1 RESTORE (D1 file) SETTING 1149 ok
M:SMA1C RESTORE (D1 file) SETTING 1149 ok
M:SMA1C1 RESTORE (D1 file) SETTING 1149 ok
D:TRSM1S RESTORE (D1 file) SETTING 1149 ok
D:TRSM1R RESTORE (D1 file) SETTING 1149 ok
D:TRSM1C RESTORE (D1 file) SETTING 1149 ok
D:TRSM1D RESTORE (D1 file) SETTING 1149 ok
M:TR109S RESTORE (D1 file) SETTING 1149 ok
M:TR109T RESTORE (D1 file) SETTING 1149 ok
M:LMHLD RESTORE (D1 file) SETTING 1149 ok
M:LMHLDS RESTORE (D1 file) SETTING 1149 ok
M:AP1WCS RESTORE (D1 file) SETTING 1149 ok
M:AP1WCT RESTORE (D1 file) SETTING 1149 ok
M:TR105S RESTORE (D1 file) SETTING 1149 ok
M:TR105T RESTORE (D1 file) SETTING 1149 ok
d:h926rp RESTORE (D1 file) SETTING 1184 ok
d:h926pb RESTORE (D1 file) SETTING 1184 ok
m:v105rp RESTORE (D1 file) SETTING 1184 ok
m:v105pb RESTORE (D1 file) SETTING 1184 ok

::: SET_SEQ FILE_SR 87 .

D:Q901 RESTORE (D1 file) SETTING 1149 ok
D:Q901 RESTORE (D1 file) ANL ALARM 1149 ok
D:V901 RESTORE (D1 file) SETTING 1149 ok
D:V901 RESTORE (D1 file) ANL ALARM 1149 ok
D:VS901 RESTORE (D1 file) SETTING 1149 ok
D:VS901 RESTORE (D1 file) ANL ALARM 1149 ok
D:HT901 RESTORE (D1 file) SETTING 1149 ok
D:HT901 RESTORE (D1 file) ANL ALARM 1149 ok
D:Q903 RESTORE (D1 file) SETTING 1149 ok
D:Q903 RESTORE (D1 file) ANL ALARM 1149 ok
D:VS904 RESTORE (D1 file) SETTING 1149 ok
D:VS904 RESTORE (D1 file) ANL ALARM 1149 ok
D:HT906A RESTORE (D1 file) SETTING 1149 ok
D:HT906A RESTORE (D1 file) ANL ALARM 1149 ok
D:VT906 RESTORE (D1 file) SETTING 1149 ok
D:VT906 RESTORE (D1 file) ANL ALARM 1149 ok
D:HT906B RESTORE (D1 file) SETTING 1149 ok
D:HT906B RESTORE (D1 file) ANL ALARM 1149 ok
D:Q907 RESTORE (D1 file) SETTING 1149 ok
D:Q907 RESTORE (D1 file) ANL ALARM 1149 ok
```

```
D:Q909 RESTORE (D1 file) SETTING 1149 ok
D:Q909 RESTORE (D1 file) ANL ALARM 1149 ok
D:HT910 RESTORE (D1 file) SETTING 1149 ok
D:HT910 RESTORE (D1 file) ANL ALARM 1149 ok
D:Q913 RESTORE (D1 file) SETTING 1149 ok
D:Q913 RESTORE (D1 file) ANL ALARM 1149 ok
D:QS915 RESTORE (D1 file) SETTING 1149 ok
D:QS915 RESTORE (D1 file) ANL ALARM 1149 ok
D:Q914 RESTORE (D1 file) SETTING 1149 ok
D:Q914 RESTORE (D1 file) ANL ALARM 1149 ok
D:H914 RESTORE (D1 file) SETTING 1149 ok
D:H914 RESTORE (D1 file) ANL ALARM 1149 ok
D:Q916 RESTORE (D1 file) SETTING 1149 ok
D:Q916 RESTORE (D1 file) ANL ALARM 1149 ok
D:Q917 RESTORE (D1 file) SETTING 1149 ok
D:Q917 RESTORE (D1 file) ANL ALARM 1149 ok
D:QS917 RESTORE (D1 file) SETTING 1149 ok
D:QS917 RESTORE (D1 file) ANL ALARM 1149 ok
D:VT917 RESTORE (D1 file) SETTING 1149 ok
D:VT917 RESTORE (D1 file) ANL ALARM 1149 ok
D:Q919 RESTORE (D1 file) SETTING 1149 ok
D:Q919 RESTORE (D1 file) ANL ALARM 1149 ok
D:QS919 RESTORE (D1 file) SETTING 1149 ok
D:QS919 RESTORE (D1 file) ANL ALARM 1149 ok
D:VT925 RESTORE (D1 file) SETTING 1149 ok
D:VT925 RESTORE (D1 file) ANL ALARM 1149 ok
D:Q924 RESTORE (D1 file) SETTING 1149 ok
D:Q924 RESTORE (D1 file) ANL ALARM 1149 ok
D:QS925 RESTORE (D1 file) SETTING 1149 ok
D:QS925 RESTORE (D1 file) ANL ALARM 1149 ok
D:HS925 RESTORE (D1 file) SETTING 1149 ok
D:HS925 RESTORE (D1 file) ANL ALARM 1149 ok
D:Q926 RESTORE (D1 file) SETTING 1149 ok
D:Q926 RESTORE (D1 file) ANL ALARM 1149 ok
D:QS926 RESTORE (D1 file) SETTING 1149 ok
D:QS926 RESTORE (D1 file) ANL ALARM 1149 ok
D:H926RP RESTORE (D1 file) SETTING 1149 ok
D:H926PB RESTORE (D1 file) SETTING 1149 ok
D:H926 RESTORE (D1 file) ANL ALARM 1149 ok
D:QS928 RESTORE (D1 file) SETTING 1149 ok
D:QS928 RESTORE (D1 file) ANL ALARM 1149 ok
A:EKIKP RESTORE (D1 file) SETTING 1149 ok
A:CH1T2 RESTORE (D1 file) ANL ALARM 1149 ok
A:CH2T2 RESTORE (D1 file) ANL ALARM 1149 ok
A:CH3T2 RESTORE (D1 file) ANL ALARM 1149 ok
A:CV1T2 RESTORE (D1 file) ANL ALARM 1149 ok
A:CV2T2 RESTORE (D1 file) ANL ALARM 1149 ok
A:CV3T2 RESTORE (D1 file) ANL ALARM 1149 ok

::: SET_SEQ FILE 41 .

I:F17B3 RESET DEVICE ok
M:HV200 RESET DEVICE ok
M:Q201 RESET DEVICE ok
M:HV202 RESET DEVICE ok
M:Q203 RESET DEVICE ok
M:Q204 RESET DEVICE ok
M:Q205 RESET DEVICE ok
M:V205 RESET DEVICE ok
M:Q206 RESET DEVICE ok
M:Q207 RESET DEVICE ok
M:Q208 RESET DEVICE ok
M:Q209 RESET DEVICE ok
```

```
::: SET_SEQ FILE 42 .

     I:F17B3 TURN DEVICE ON ok
     M:HV200 TURN DEVICE ON ok
     M:Q201 TURN DEVICE ON ok
     M:VT101 TURN DEVICE ON ok
     M:VT101A TURN DEVICE ON ok
     M:Q102R SET NEGATIVE ok
     M:Q202 TURN DEVICE ON ok
     M:HV202 TURN DEVICE ON ok
     M:Q203 TURN DEVICE ON ok
     M:Q204 TURN DEVICE ON ok
     M:Q205 TURN DEVICE ON ok
     M:HT105 TURN DEVICE ON ok
     M:V205 TURN DEVICE ON ok
     M:Q206 TURN DEVICE ON ok
     M:Q207 TURN DEVICE ON ok
     M:HT107 TURN DEVICE ON ok
     M:Q208 TURN DEVICE ON ok
     M:VT108 TURN DEVICE ON ok
     M:Q209 TURN DEVICE ON ok

::: SET_SEQ FILE 47 .

     D:Q901 RESET DEVICE ok
     D:V901 RESET DEVICE ok
     D:Q903 RESET DEVICE ok
     D:Q907 RESET DEVICE ok
     D:Q909 RESET DEVICE ok
     D:Q913 RESET DEVICE ok
     D:Q914 RESET DEVICE ok
     D:H914 RESET DEVICE ok
     D:Q916 RESET DEVICE ok
     D:Q917 RESET DEVICE ok
     D:Q919 RESET DEVICE ok
     D:Q924 RESET DEVICE ok
     D:Q926 RESET DEVICE ok
     D:H926 RESET DEVICE ok

::: SET_SEQ FILE 48 .

     D:Q901 TURN DEVICE ON ok
     D:V901 TURN DEVICE ON ok
     D:HT901 TURN DEVICE ON ok
     D:Q903 TURN DEVICE ON ok
     D:HT906A TURN DEVICE ON ok
     D:VT906 TURN DEVICE ON ok
     D:HT906B TURN DEVICE ON ok
     D:Q907 TURN DEVICE ON ok
     D:Q909 TURN DEVICE ON ok
     D:HT910 TURN DEVICE ON ok
     D:Q913 TURN DEVICE ON ok
     D:Q914 TURN DEVICE ON ok
     D:H914 TURN DEVICE ON ok
     D:Q916 TURN DEVICE ON ok
     D:Q917 TURN DEVICE ON ok
     D:VT917 TURN DEVICE ON ok
     D:Q919 TURN DEVICE ON ok
     D:Q924 TURN DEVICE ON ok
     D:Q926 TURN DEVICE ON ok
     D:H926 TURN DEVICE ON ok
```

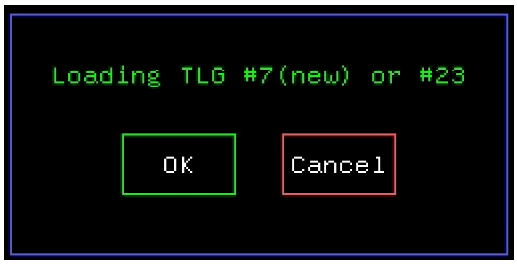
```
D:VT925 TURN DEVICE ON ok

::: ALARM_LIST PBAR 12 .
::: EVENT 91 DISABLE .
::: WAIT_FOR SECS 10 .
::: CTL_DEVICE M:Q102 RESET .
::: CTLIT_DEVICE M:Q202 ON .
::: ALARM_LIST PBAR 3 .
```

Enables the D59 alarm list entitled “AP1 8GEV”.



Pbar alarm list 3 after it has been enabled by the Pbar Sequencer. Click on thumbnail to view full-sized image.

```
::: ACL COMPARE_10_DEVICES .
::: ACL COMPARE_10_DEVICES .
::: ACL COMPARE_10_DEVICES .
::: ACL COMPARE_10_DEVICES .
::: WAIT_FOR SECS 3 .
::: ACKNOWLEDGE .
```




```
::: LOAD_TLG 7 REPEAT .
::: WAIT_DEVICE G:TLGSEQ .
::: EVENT 88 TRIGGER .
::: BOOST_INTENSITY EVT16 2 .
::: SETIT_DEVICE V:PSHOOT =4 .
::: BEAM_SWITCH Pbar_Source On .
::: ALARM_LIST PBAR 52 .
```

Bypasses the D59 alarm list entitled “ARF1”.

Pbar alarm list 52 after it has been bypassed by the Pbar Sequencer.. Click on thumbnail to view full-sized image.

```
::: WAIT_FOR SECS 3 .
::: ALARM_LIST PBAR 23 .
```

Bypasses the D59 alarm list entitled “PULSED” (pulsed devices).

Pbar alarm list 23 after it has been bypassed by the Pbar Sequencer. Click on thumbnail to view full-sized image.

```
::: SET_SEQ FILE 1 .

    D:LNV TURN DEVICE OFF ok
    D:PMAGV TURN DEVICE OFF ok
    D:ISEPV TURN DEVICE OFF ok
    D:IKIK TURN DEVICE OFF ok
    D:EKIK TURN DEVICE OFF ok
    d:ekikq TURN DEVICE OFF ok
    D:ESEPV TURN DEVICE OFF ok
    A:ISEP1V TURN DEVICE OFF ok
    A:ISEP2V TURN DEVICE OFF ok
    A:IKIK TURN DEVICE OFF ok
    A:R1L1AM TURN DEVICE OFF ok
    A:R1L2AM TURN DEVICE OFF ok
    A:R1HLSC TURN DEVICE OFF ok
    A:EXTRAT EVENT DISABLE ok
    A:EKIKTG SET DEVICE 13.8365 ok
    d:q701 TURN DEVICE OFF ok
    d:q702 TURN DEVICE OFF ok
    d:h704 TURN DEVICE OFF ok

::: SET_SEQ FILE 83 .

    A:CBPON SET DEVICE 3 ok
    A:CBPOFF SET DEVICE 0 ok
    A:CBPON SET TIMER REFER 99 ok
    A:CBPOFF SET TIMER REFER 99 ok
    A:CBPON EVENT ENABLE ok
    A:CBPOFF EVENT ENABLE ok

::: SET_SEQ FILE 85 .

    A:R1HLT1 SET DEVICE 1.575 ok
    A:R1HLT1 SET TIMER REFER 9A ok
    A:R1HLT1 EVENT ENABLE ok
    A:R1LLT3 SET DEVICE 0 ok
    A:R1LLT3 SET TIMER REFER 9A ok
    A:R1LLT3 EVENT ENABLE ok
    A:R1LLT4 SET DEVICE .000211 ok
    A:R1LLT4 SET TIMER REFER 94 ok
    A:R1LLT4 EVENT ENABLE ok
    A:IBMS1 SET DEVICE .1 ok
    A:IBMS1 SET TIMER REFER 91 80 ok
    A:IBMS1 EVENT ENABLE ok
    A:IBMS2 SET DEVICE 1 ok
    A:IBMS2 SET TIMER REFER 94 80 ok
    A:IBMS2 EVENT ENABLE ok
    d:smb2c ADD TIMER EVENT 9A ok
    d:smb2c REMOVE TIMER EVNT E1 ok
    SET TIMER REFER 2D ok
    SET DEVICE 2.48 ok
    EVENT ENABLE ok
    D:ESEPC SET DEVICE .00001 ok
    D:ESEPC ADD TIMER EVENT 90 ok
    D:ESEPC REMOVE TIMER EVNT 80 ok

::: CTL_DEVICE A:ISHUTO OFF .
::: CTL_DEVICE A:ESHUTO OFF .
::: CTL_DEVICE A:ISHUTC ON .
::: CTL_DEVICE A:ESHUTC ON .
::: START_PGM SA1144 .
```

```
::: START_PGM SA1144 .
::: INSTRUCT 302 .
```

```
Start the VSA display on this console using slot C.
Select concole [Lcl] and target slot GxSC.

          Interrupt anywhere in this box to continue.
```

```
::: START_PGM SA1136 D
::: START_PGM SA1156 .
::: WAIT_FOR SECS 15 .
::: ACL SET_FROM_READING .
::: SET_DEVICE A:VSAFWD -=5 .
::: SETIT_DEVICE A:VSAFWM =15 D
::: SETIT_DEVICE A:DTMHVE =.5 .
::: SETIT_DEVICE A:VSARST =5 .
::: CHECK_DEVICE A:VSAFWS READING .
::: INSTRUCT 303 .
```

```
STOP! The VSA and cooling have been set up as a function of stack
size by setting A:VSAFWD 5 Hz less than A:VSAFWS (the suggested
VSAFWD based on stack size).
If studies are being conducted with a large stack, it is
is necessary to set the desired frequency, A:VSAFWD, to a more
more resonable value of at least 25.

Regularly monitor the emittances, frequency width, and stack
size to ensure stability using the plot started next.

          Interrupt anywhere in this box to continue.
```

```
Start plot on Adjac. Console

OK        Cancel
```

```
::: ACKNOWLEDGE .
::: AUTO_PLOT Core Emittances .
::: INSTRUCT 213 D
::: START_PGM P194 D
::: SPECTRUM_LOAD 2 7 .
::: SEQ_PGM REQUEST AP0 Scope .
::: CHECK_DEVICE A:R2DDS1 SAVE_SET .
::: CHECK_DEVICE A:R2LLAM SAVE_SET .
::: CHECK_DEVICE A:DPHATT SAVE_SET .
::: CUSTOM COOL_GAIN .
::: SET_DEVICE A:DPHATT =5 .
::: SEQ_PGM REQUEST Acc Gap Mon .
::: CHECK_DEVICE A:SCRES SAVE_SET .
::: SET_DEVICE A:SCRES +=1.8 .
::: ALARM_LIST PBAR 76 .
      Bypasses the D59 alarm list entitled "DEB COOL" (Debuncher Cooling).
      This list contains a number of other lists.
```

Pbar alarm list 76 after it has been enabled by the Pbar Sequencer. Click on thumbnail to view full-sized image.

::: SET_SEQ FILE 92 .

```
D:H1PS1 TURN DEVICE OFF ok
D:H2PS1 TURN DEVICE OFF ok
D:H3PS1 TURN DEVICE OFF ok
D:H4PS1 TURN DEVICE OFF ok
D:V1PS1 TURN DEVICE OFF ok
D:V2PS1 TURN DEVICE OFF ok
D:V3PS1 TURN DEVICE OFF ok
D:V4PS1 TURN DEVICE OFF ok
D:P1PS TURN DEVICE OFF ok
D:P2PS TURN DEVICE OFF ok
D:P3PS TURN DEVICE OFF ok
D:P4PS TURN DEVICE OFF ok
```

ok

INSTRUCT 309 .

```
Move on to the next aggregate, Fast Recycler Reverse Protons.

        Interrupt anywhere in this box to continue.
```

Fast Recycler Aggregate: Fast Recycler Start has been completed.
Next Aggregate: Fast Recycler Reverse Protons
How to get back to stacking form here: