# Mainboard Burn-In overview.

There are 5 burn-in test stands (at1.uchicago.edu-at5.uchicago.edu). On each stand are 2 heater boxes holding 2 MainBoards each. To start a run, MainBoards are put in the boxes at positions 1 -4. The heat controllers at the far end of the boxes are turned on. Once the boxes are up to temperature (65°C), the usb temperature probes are tested by running:
>python ftmp.py
If both probes are reading correctly, the run can begin.
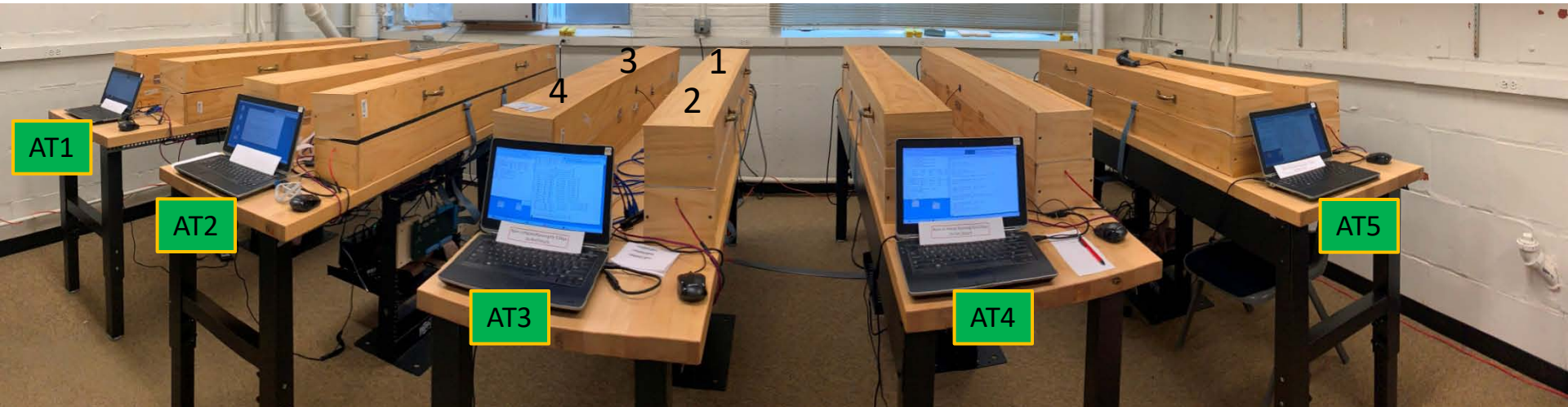
The run is started with:
>python3 rs.py
The operator is prompted to scan each MainBoard serial number bar code. The code will go through the test of each mainboard. If run.state text file contains a zero, rs.py pauses for 30 sec and then loops back to another read cycle.   If Run.state is 1, the run terminates and a final error summary is printed out. (rs.py executes bpy.c to read the data each cycle)

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```
=================== mb=0 =============================
controller test send=8b4567 return=8b4567   OK
controller test send=7b23c6 return=7b23c6   OK
controller test send=3c9869 return=3c9869   OK
controller test send=334873 return=334873   OK
controller test send=b0dc51 return=b0dc51   OK
FrameClock mb=0   ADC=0    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=1    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=2    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=3    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=4    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=5    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=6    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=7    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=8    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=9    Count=10000   stop=10000   OK
FrameClock mb=0   ADC=10   Count=10000   stop=10000   OK
FrameClock mb=0   ADC=11   Count=9999    stop=10000   OK
FPGA r/w test mb=0 fpga=0    sent=19495cff   returned=19495cff  OK
FPGA r/w test mb=0 fpga=1    sent=2ae8944a   returned=2ae8944a  OK
FPGA r/w test mb=0 fpga=2    sent=625558ec   returned=625558ec  OK
FPGA r/w test mb=0 fpga=3    sent=238e1f29   returned=238e1f29  OK


=================== mb=1 =============================
controller test send=e87ccd return=e87ccd   OK
controller test send=1b58ba return=1b58ba   OK
controller test send=7ed7ab return=7ed7ab   OK
controller test send=b141f2 return=b141f2   OK
controller test send=b71efb return=b71efb   OK
```

Controller alive test.

Count ADC Frame Clocks
And compare to direct clock count
(40MHz clock on MB)

Must agree within 1 count

FPGAs Working
random number r/w

Repeat for each MainBoard

```
mb=1  CTRL=0  kmb=1
FRM   0 0 0 0 0 0 0 0 0 0 0 0
FPGA  0 0 0 0

mb=2  CTRL=0  kmb=2
FRM   0 0 0 0 0 0 0 0 0 0 0 0
FPGA  0 0 0 0

mb=3  CTRL=0  kmb=3
FRM   0 0 0 0 0 0 0 0 0 0 0 0
FPGA  0 0 0 0
+++++++++++++++++ Error Summary ++++++++++++++++++

serial= 20LLCHI10V40097    mb=0  sCTRL=0
sFRM  0 0 0 0 0 0 0 0 0 0 0 0
sFPGA  0 0 0 0

serial= 20LLCHI10V40098    mb=1  sCTRL=0
sFRM  0 0 0 0 0 0 0 0 0 0 0 0
sFPGA  0 0 0 0

serial= 20LLCHI10V40099    mb=2  sCTRL=0
sFRM  0 0 0 0 0 0 0 0 0 0 0 0
sFPGA  0 0 0 0

serial= 20LLCHI10V40100    mb=3  sCTRL=0
sFRM  0 0 0 0 0 0 0 0 0 0 0 0
sFPGA  0 0 0 0
EVENT = 3724 Run Time: 02:04:57:18
 EVENT=3724  t0=65.00    t1=67.70
waiting 30 sec
```

error summary for read cycle
0 means no errors

running error sum

elapsed time of run

USB temperature probes in each box to see remotely heat is on

Wait 30 sec and repeat

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When run.state is set to one, the run terminates.
A file with each MainBoards serial number as it's name is created
and the final error summary is write.

For example the file 20LLCHI10V40049 contains:

EVENT = 8802 Run
Time: 05:00:55:50
serial= 20LLCHI10V40049   mb=2
sCTRL=0
sFRM 0 0 0 0 0 0 0 0 0 0 0 0
sFPGA 0 0 0 0

These files are retained.