PMT Amplification Progress

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Progress

- Working breadboards have been acquired
  - Amplifier tests are ready to begin
  - Comparison of the LM 741 C and LMH 730154
- Preliminary PMT test has been run
  - Data has not been collected yet
  - Hamamatsu R4125HA PMT was used

Software Setbacks

- The computer reserved for data collection has undergone software/hardware failure

- The kernel has crashed and fails to load on the machine

- Error Stack

```
export: 63: PATH=/sbin:/bin:/usr/sbin:/usr/bin: bad variable name
Kernel panic - not syncing: Attempted to kill init!
Pid: 1, comm: init Not tainted 2.6.32-358.e16.i686 #1
Call Trace:
[<c084771f>] ? panic+0x6e/0x122
[<c045cff1>] ? do_exit+0x741/0x750
[<c045d03c>] ? do_group_exit+0x3c/0xa0
[<c045d0b1>] ? sys_exit_group+0x11/0x20
[<c084a2f4>] ? syscall_call+0x7/0x6
```

Update on Software Setbacks

- We just fixed the computer! Yay!
- We fixed it by replacing the RAM (our hypothesis was correct)
- So now we can move along on collecting data from PMT's

PMT Setbacks

- The signal contains noise of approximately 3-5 mV
- The tube has not been yet adjusted to the sensitivity of single photons
- We may build a module in which to hold the LED's

PMT Progress

- We are receiving a signal of approximately 10 mV
- We are operating the tube voltage at 1100 volts
  - According to *Photomultiplier Tubes and Assemblies for Scintillation Counting and High Energy Physics* **by Hamamatsu Corporation** the tube needs to be operated at 200 to 300 volts lower than the specified maximum
- We are exciting the PMT with a red LED at 2.35 volts with 10 millisecond pulses in a dark box
- The PMT gain is listed as 8.7 x 10^5, This needs to be tested

Primary Goals

- Test the different amplifiers
- Begin collecting data on the PMT's with our newly fixed computer