



MULTIPLE MIRROR TELESCOPE OBSERVATORY

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MMT Technical Memorandum 87-1

From: Phil Massey
Re: Reducing MMT Spectrograph Data with IRAF
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Although many powerful tools exist within IRAF, packages such as ONEDSPEC are header driven and can be awkward to use on non-Kitt Peak data. Although this situation may be corrected in the near future, this guide will show you how to reduce MMT data relatively painlessly now, and may prove useful in reducing data taken with similar instruments. In particular I've noted what to do differently with Steward 90" data. This guide assumes that you have a passing acquaintance with IRAF (i.e., about what I had when I started these reductions) and that you are starting with a FITS tape written on the mountain. People trying to reduce 90" Steward data will need to have run their data through the Steward program IRS that will convert an internal Steward format to a FITS tape; you might as well do sky subtraction while you are at it. I did not actually flux-calibrate my MMT data, but I've given some notes as to how to do it.

(1) Get into **noao** and then load **dataio** and **onedspec**.

(2) Load your tape into IRAF by **allocate mta** (or **mtb** or whatever drive you happen to be using) and then do an **rfits mta 1-999 mmt.0 make+ long+ data=r > fitshead**. This will create file names of the proper form for ONEDSPEC to operate on; i.e., **mnt.0001**, **mnt.0002**, etc. The complete fits header will be written to the file **fitshead**. Substitute the final number for **999** in all of the following.

(3) Next we need to get rid of the garbage channels at the end. Use **splot** to examine a quartz exposure from the left channel. The cursor commands **a** (for autoexpand) and **c** (prints the value of the cursor position) will be useful; use **g** to get a quartz exposure from the right channel and finally **q** to quit. While looking at the data, decide what pixel range contains useful data (channels 1-3915 in 8k mode, say). To keep only the useful channels, do an **imcopy mmt.0*[1:3915] mmt.0***. This will rewrite only channels 1-3915 over the old files, so really know what channels you want to keep before doing this step.

(4) Next we are going to fix the headers so that ONEDSPEC can tell the left channel from the right; this will make everyone's life easier. Create two files containing the names of your spectra by typing **files mmt.0* > beam0** and **files mmt.0* > beam1**. Next **edit** these files so that only the left-beam file names are in **beam0** and only the right-beam file names are in **beam1**. This will likely be just the odd numbers and even numbers respectively. Add the beam-numbers to the header info by **hedit @beam0 BEAM-NUM 0 show+ ver+ add+ up+** and **hedit @beam1 BEAM-NUM 1 show+ ver+ add+ up+**.