Center for Astrophysics

Harvard College Observatory
Smithsonian Astrophysical Observatory

MEMORANDUM

25 August 1998

To:	Mike Wise
From:	Steve Murray
Subject:	HRC-S Coordinates
re:	Revised 28 August 1998
cc:	J. McDowell, D.Dewey, M.Zombeck

Enclosed is a sketch of the HRC-S showing the HRC V coordinates (after a reasonable degap) of the active region of the three segments, and also indicating the preliminary values of the coordinate discontinuities at the segment boundaries.

For Segment +1 (i.e., the segment in the +Y spacecraft direction) the physical edge of the detector is at V = 1196 pixels, the beginning of the active area is at V=1665 pixels. The end of the active area is at V = 16404 pixels, and the physical edge is at V = 16444 (not shown).

For the middle segment (Segment -0), the physical edge is at V = 16900 (not shown), and the active area starts at V = 17060, at the other edge the active area ends at V = 32165, and the physical edge is at V = 32250.

For Segment -1 (i.e., the segment in the -Y spacecraft direction) the physical edge is at V = 32930, and the active area starts at V = 32975. At the other end, the active area ends at V = 47605, while the physical edge extends to V = 48117.

The tilt angles are 1.4321 degrees for Segment +1 and 1.2202 degrees for Segment -1. The discontinuities are given in pixels assuming these tilts and a thickness of 4.090mm. These discontinuities have NOT been applied to the V-coordinate values given above, which are the readout values (degapped, but otherwise uncorrected for geometry) as generated by the electronics. I believe that the degapping used is good to about 1 pixel so there should not be too much uncertainty in these values.

As we discussed at our meeting, the nominal zero points for the HRC-S should be set so that the origin of the physical system is at the middle of the electrical system (before corrections). That would be at V - 24576 (coarse position 96). In the U axis the origin should be at U = 2048 (coarse position 8).

The conversion of pixels to mm is different for U and V. For U, the correct value is 0.006250 mm/pixel. For V, the correct value is 0.0064294 mm/pixel.

The geometry of the detector in the U-axis is not as well known as in the V-axis. For the time being, it is safe to use a physical size of U = 0 to U = 4096 pixels (for all segments) and an active area of U = 560 to U = 3536 (a total active width of 18.6mm).

Getting the relationship of the various UVIS regions in HRC-S coordinates is not a simple matter. It involves some effort to find contrast differences in flat field images that were taken after the final assembly of the detector. Unfortunately the HESF (aka the Drake/Murray Flats) and the orientation of the detector and the calibration facility make these data ambiguous in determining the exact geometry in the U direction. I will try to improve on these values when I get some time.

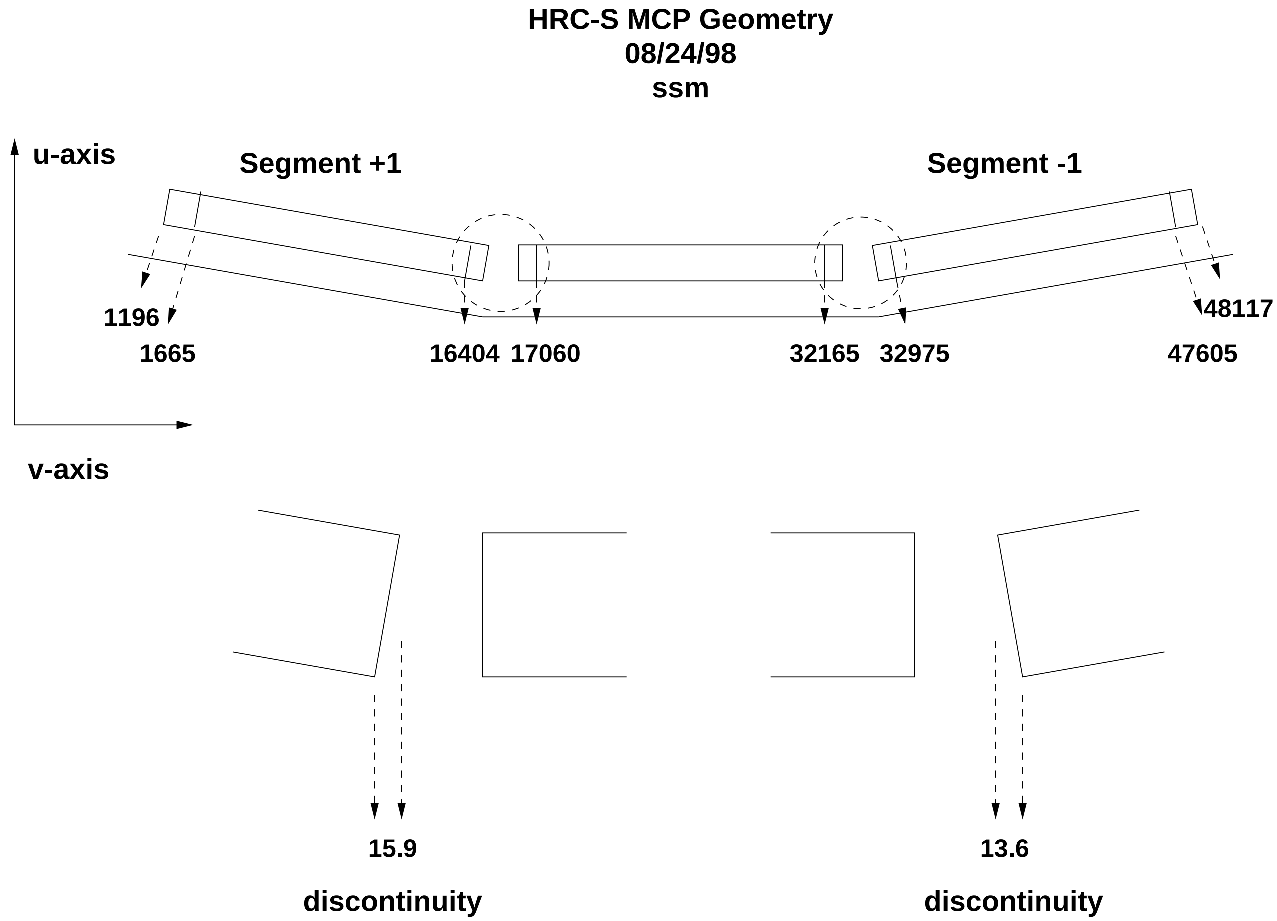

Figure 1: The HRC-S Coordinates