much more leverage than Earth-based observations. The date for these observations was chosen so that 1) the plane-of-sky uncertainty would be small enough to ensure that C/2013 A1 would be in the field of view; 2) there would be enough time to transmit the images to the ground, perform the astrometric reduction, update the ephemeris and the pointing for the close approach observations; 3) the observations would provide the needed leverage to constrain the trajectory of C/2013 A1.

The HiRISE observations utilized the three central broadband RED CCDs in the instrument focal plane (McEwen et al., 2007), yielding images of the star field surrounding C/2013 A1 that were $\sim 20'$ on a side as shown in Fig. 3. The scanning rate was selected to obtain the maximum useful integration time of the HiRISE instrument, 2.56 seconds. The individual CCD images were corrected for dark current, instrument noise and for low frequency spacecraft jitter. The CCD images were joined together utilizing reconstructed SPICE kernels provided by NASA's Navigation and Ancillary Information Facility (Acton, 1996) and SPICE related utilities in the Integrated Software for Imagers and Spectrometers software package (Torson and Becker, 1997), resulting in a single mosaic of the three CCDs to which an astrometric solution could be applied. To determine the background star positions on the CCD mosaic, their centroids were measured and a plate solution computed from a least squares fit of these star positions. The position of the comet was determined by measuring the centroid of the comet image and converted into RA and DEC via the plate solution. Since HiRISE is