for a large change in airmass with a M4 comparison star, the maximum deviation would be significant relative to our $\sim$1% accuracy goal.

In order to estimate which stellar spectral types apply for our observations, we used multi-color data obtained for a minority of our QSO fields (about 23) under "marginally" photometric conditions. We used three non-standard red filters: R_s, r1, and R2, as well as a standard R band filter. The additive corrections to convert these to standard R (as measured from the observations) are: –0.27, –0.29, and –0.28, respectively, ignoring color corrections. The data are shown in three color-color UBVRI diagrams in figure 7-2 , along with the colors for main sequence stars taken from Bahcall and Soneira (1981) and Silva and Cornell (1992). The stars are shown as dots, while the asterisks indicate QSOs. The apparent deviation in our data from the spectral types is due to errors in the flux calibrations and color correction errors due to our filters and detectors relative to the standard UBVRI. The corrections to each filter will depend on the color of each star, but for our purposes it is sufficient to assume only constant additive corrections for each filter.

From our calibrations and data set we can estimate that the error in any given bandpass relative to the other bandpasses is not greater than about 10%. Using this constraint we have done a fit which minimizes the error associated with identifying each star with a given main sequence spectral type (*i.e.* fit our data to the standard color-color diagram). The corrections used for U, B, V, R, and I were 0.08, –0.02, 0.04, –0.05, and 0.03, respectively. Note that a constant offset could be applied to all five values which would not change the spectral type identification. However, these values suggest a minimum value for the error in relating our data to the standard set.

The distribution of spectral types is shown in figure 7-3 , along with a histogram of the maximum change in airmass and the magnitude of the brightest comparison star for each QSO field. Equal-distance contours are drawn for main sequence stars at 0.1, 1.0, and 10 kpc, and for giants (luminosity class III) at 10 kpc. The QSOs studied in this project are typically at high galactic latitudes, so the distance at which we reach one