UCAC
U.S. Naval Observatory
CCD Astrograph Catalog

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UCAC Instrumentation

**Telescope**
- Focal length: 2057mm
- Plate scale: 100”/mm
- Bandpass: 550-710nm

**CCD:**
- Chip size: 4094 x 4094 pixels
- Pixel Size: 9.0 microns
- Pixel scale: 0.905”/pixel
- Field of view: 61 x 61 arcmin
- Bandpass: 579-642nm
UCAC Observing

Preliminary reductions
Global adjustment
2-fold overlap
Two exposures per field:
  25 second exp
  125 second exp
  200 second exp
Observing rate

Tycho-2
Hipparcos
each star on two fields
8.0\textsuperscript{th} - 14.5\textsuperscript{th} mag
10.0\textsuperscript{th} - 16.0\textsuperscript{th} mag
10.5\textsuperscript{th} - 16.5\textsuperscript{th} mag (ICRF sources)
200 frames (100 fields) per night

Observing rate 200 frames (100 fields) per night
# UCAC Accuracy

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&lt;sup&gt;th&lt;/sup&gt;</td>
<td>40 mas</td>
</tr>
<tr>
<td>9&lt;sup&gt;th&lt;/sup&gt;</td>
<td>30 mas</td>
</tr>
<tr>
<td>10&lt;sup&gt;th&lt;/sup&gt; – 14&lt;sup&gt;th&lt;/sup&gt;</td>
<td>20 mas</td>
</tr>
<tr>
<td>15&lt;sup&gt;th&lt;/sup&gt;</td>
<td>40 mas</td>
</tr>
<tr>
<td>16&lt;sup&gt;th&lt;/sup&gt;</td>
<td>70 mas</td>
</tr>
</tbody>
</table>
## UCAC Proper Motions

<table>
<thead>
<tr>
<th>Mag</th>
<th>Source Catalogs</th>
<th>Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0&lt;sup&gt;th&lt;/sup&gt; - 11.0&lt;sup&gt;th&lt;/sup&gt;</td>
<td>140 TC/PC, AC</td>
<td>1-2 mas/yr</td>
</tr>
<tr>
<td>11.0&lt;sup&gt;th&lt;/sup&gt; - 12.5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>AC, AGK2</td>
<td>2 mas/yr</td>
</tr>
<tr>
<td>12.5&lt;sup&gt;th&lt;/sup&gt; - 16.0&lt;sup&gt;th&lt;/sup&gt;</td>
<td>NPM, SPM</td>
<td>3-5 mas/yr</td>
</tr>
</tbody>
</table>
## Catalog Density (stars/sq deg)

<table>
<thead>
<tr>
<th>Catalog</th>
<th>Average</th>
<th>Max</th>
<th>Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCAC</td>
<td>1,700</td>
<td>55,000</td>
<td>300</td>
</tr>
<tr>
<td>Hipparcos</td>
<td>3</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Tycho-2</td>
<td>60</td>
<td>350</td>
<td>6</td>
</tr>
</tbody>
</table>
UCAC Milestones

Feb 1998: started observations from Chile
Mar 2000: UCAC1 released
UCAC1

27 million star positions with proper motions
Sky coverage: -90 to -6 degrees declination
Magnitude range: 8\textsuperscript{th} to 16\textsuperscript{th}
Positions on ICRS
Epoch: 1999.0
Proper motions using Tycho-2 & USNO A2.0
Available on CD-ROM
UCAC Milestones

Feb 1998:  started observations from Chile
Mar 2000:  UCAC1 released
Sep 2000:  southern hemisphere completed
May 2001:  end observations from Chile
Jun 2001:  start observations from Flagstaff
2003:      northern hemisphere completed
2004:      final catalog released
UCAC Information

Astronomical Journal paper: Zacharias et al., vol 120, pp 2131-2147, October 2000

USNO web site: http://ad.usno.navy.mil/ucac/