THE HIPPARCOS CATALOGUE CONTENTS

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ABSTRACT

The principal observational characteristics of the Hipparcos Catalogue, and a summary of its main astrometric and photometric properties, are presented. The catalogue is a materialisation of the ICRS reference system, coinciding with its principal axes at the level of ± 0.6 mas, and with individual proper motions consistent with an inertial system at the level of ± 0.25 mas/yr. The 118 218 constituent stars provide a mean sky density of ~ 3 stars deg^{-2}. Stars whose space motions were well described by the standard model of five astrometric parameters have these values, their standard errors, correlation coefficients, and other solution details, provided. More 'complex' systems are characterised in one of five parts of the Double and Multiple Systems Annex. The catalogue includes a variety of accurate and homogeneous photometric information for each star, including the Johnson V magnitude, B–V and V–I colour indices, and accurate multi-epoch broad-band photometric data suitable for variability studies. Flags indicate connection to annexes, notes, and references. The catalogue is available in printed and machine-readable forms.

Key words: Hipparcos; space astrometry.

1. INTRODUCTION

Details of the Hipparcos observations, and their reductions, have been presented in the literature on previous occasions, with the most complete and definitive treatment contained within the published Hipparcos Catalogue itself (ESA 1997). This contribution is presented as a description of the contents of the Hipparcos Catalogue: summarising what information is presented in the catalogue and, briefly, its origin.

Accompanying contributions deal with the detailed astrometric properties of the Hipparcos Catalogue (Mignard), details of the connection of the Hipparcos Catalogue to an extragalactic reference frame (Kovalevsky), details of the Hipparcos Double and Multiple Systems Annex (Lindegren), The Hipparcos Photometry and Variability Annexes (van Leeuwen), the detailed contents of the Tycho Catalogue (Høg), details of the solar system objects observed by Hipparcos and Tycho (Hestroffer), and the details of the ASCII CD-ROMs and access software (Schrijver).

The satellite observations yielded a system of measurements from which, for each star observed, the barycentric coordinate direction (α, δ), the parallax (π), and the object's proper motion ($\mu_\alpha \cos\delta$, μ_δ) could be solved for in what was effectively a least-squares reduction of the global observations. The astrometric parameters as well as their standard errors and correlation coefficients were derived in the process. A summary of the principal observational characteristics of the catalogue is given in Table 1.

The adopted catalogue epoch is J1991.25, close to the mean central epoch of the observations for each star. The provision of the correlation coefficients for each astrometric solution allows the standard errors of transformed quantities to be determined at an arbitrary epoch, including the epoch at which the standard error is minimised for each individual star.

The details of the connection of the observations to the extragalactic reference frame have been presented by Kovalevsky et al. (1997). The resulting Hipparcos Reference Frame is a materialisation of the International Celestial Reference System (ICRS), which replaces the FK5 system as the practical definition of celestial coordinates in the optical region. The construction of the ICRS (Folkner et al. 1994; Arias et al. 1995) ensures that no discontinuity larger than the uncertainty of the FK5 system occurs in the transition from FK5 (mean equinox and equator J2000) to ICRS. Thus, from the viewpoint of optical astrometry, the Hipparcos Catalogue can be regarded as an extension and improvement of the J2000(FK5) system, retaining approximately the global orientation of that system but without its regional errors.

Since the number of independent geometrical observations per object was large (typically of order 30) compared with the number of unknowns for the standard model (5 astrometric unknowns per star) astrometric solutions not complying with this simple 'five-parameter' model, could be expanded to take into account the effects of double or multiple stars, or non-linear photocentric motions ascribed to unresolved 'astrometric binaries'.

A somewhat larger number of actual observations per object, of order 110, provided accurate and homogeneous photometric information for each star, from which mean magnitudes, variability amplitudes, and

$19^h\ 11^m\ 39^s$ - $19^h\ 12^m\ 46^s$ **1896**

94301 - 94400

Number HIP	Descriptor: epoch J1991.25 RA h m s	Dec ±° ′ ″	V mag		Position: epoch J1991.25 α (ICRS) deg	δ deg		Par. π mas	Proper Motion $\mu_{\alpha*}$ mas/yr	μ_δ	Standard Errors $\alpha*$ mas	δ	π	$\mu_{\alpha*}$ mas/yr	μ_δ	Astrometric Correlations (%) δ $\alpha*$	π $\alpha*$	π δ	$\mu_{\alpha*}$ $\alpha*$	$\mu_{\alpha*}$ δ	μ_δ $\alpha*$	μ_δ δ	μ_δ π	μ_δ $\mu_{\alpha*}$	Soln F1 %	F2
1 2	3	4	5	6 7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
94301	19 11 39.93	+19 25 54.2	9.32	H	287.916 356 71	+19.431 710 10		4.36	10.76	12.29	0.88	1.03	1.47	1.11	1.55	+39	−15	−32	− 7	−16	+22	− 8	+ 8	−24	+29	3	−0.08
94302	19 11 40.52	+56 51 32.7	5.13	H	287.918 837 62	+56.859 095 94		9.57	48.09	48.00	0.44	0.45	0.47	0.51	0.61	− 1	+ 8	+ 3	+17	+ 2	− 5	+ 1	+16	−11	+ 3	1	0.76
94303	19 11 41.74	−33 42 31.2	10.70	G	287.923 923 90	−33.708 672 65		5.45	3.45	−18.20	2.44	1.16	2.39	4.06	1.96	+ 0	−16	−18	+26	+34	−17	+ 2	−45	+30	−47	0	0.43
+94304	19 11 41.95	−81 24 46.5	7.60	H	287.924 807 49	−81.412 923 39		9.72	19.40	35.91	0.54	0.59	0.70	0.64	0.76	− 6	−23	+ 5	+ 0	−10	− 1	− 8	+13	− 5	−12	0	0.32
+94305	19 11 41.93	+09 57 06.2	8.44	H	287.924 721 08	+09.951 709 33		3.77	1.11	−8.82	1.12	0.77	1.28	1.25	0.86	−14	−12	−19	−26	+26	−28	+16	−39	+37	−22	0	−0.29
94306 H	19 11 43.52	+17 53 01.0	8.20	G	287.931 328 93	+17.883 612 16	A	0.57	1.30	−7.00	1.31	1.17	1.58	1.83	1.60	+13	− 9	−15	+55	− 9	+15	−15	+20	−11	−10	2	0.37
94307	19 11 44.21	−47 11 16.7	9.66	H	287.934 207 13	−47.187 963 08	A	7.43	−13.75	−8.22	1.96	1.51	1.91	2.56	1.94	+39	−14	−18	−11	−19	+ 3	−23	−51	+12	+41	1	−0.02
94308	19 11 45.03	+26 14 57.6	7.80	H	287.937 607 07	+26.249 326 14	A	8.34	2.81	−5.67	0.67	0.85	1.09	0.72	0.93	−13	−17	+ 1	+23	+ 6	− 5	+ 8	+ 0	− 3	−10	2	2.19
94309	19 11 45.35	−19 11 21.6	8.15	2 H	287.938 964 02	−19.189 330 69		5.84	7.06	11.43	0.89	0.55	0.99	1.05	0.67	+ 8	−14	− 3	− 6	−11	+20	−12	−43	−14	− 3	0	0.92
94310 H	19 11 45.76	−53 19 22.0	8.90	H	287.940 663 10	−53.322 766 02	A	15.39	58.23	−37.78	2.31	2.49	2.32	2.74	1.81	+26	− 8	−14	+ 3	−11	−24	−28	−44	− 8	+ 5	1	0.68
94311	19 11 46.01	+31 17 00.5	5.93	1 H	287.941 712 76	+31.283 463 60		3.33	−3.17	−3.16	0.38	0.44	0.55	0.45	0.55	−11	− 8	−16	+ 4	+11	− 2	+11	+ 9	+13	−14	0	−1.63
94312	19 11 46.35	−31 07 45.8	12.40	2 H	287.943 111 87	−31.129 399 09		−3.74	20.08	−2.68	6.76	3.24	7.41	7.76	5.90	+16	−35	+12	+ 2	−15	−10	−22	−55	+18	+16	7	1.13
94313	19 11 46.62	+18 05 16.2	7.62	H	287.944 262 91	+18.087 820 96		7.12	−7.18	−8.16	0.61	0.59	0.86	0.93	0.86	+12	−11	−15	+43	−11	+20	−15	+20	+ 1	−15	0	−1.57
94314	19 11 47.24	+12 52 16.1	9.27	H	287.946 850 59	+12.871 136 27		3.33	0.47	3.99	1.06	0.99	1.44	1.07	0.98	+ 2	−28	−22	−26	+ 2	+20	+ 6	−31	+ 5	+ 3	3	−0.40
94315	19 11 47.60	+13 54 33.3	8.78	H	287.948 314 45	+13.909 261 07		3.87	0.97	−9.12	0.71	0.76	1.12	0.81	0.87	+27	−11	−15	+10	−29	+15	−30	−14	+ 4	+20	2	0.74
94316	19 11 49.77	+05 22 38.3	7.92	H	287.957 367 84	+05.377 298 93		3.08	22.82	12.21	0.93	0.72	1.15	1.05	0.73	+12	−14	− 1	−30	−15	−23	−16	−41	+ 7	−14	0	−1.10
94317	19 11 50.06	+08 42 39.3	11.25	H	287.958 570 84	+08.710 903 69	B	1.33	0.85	−5.84	43.82	28.65	3.89	4.57	2.98	+ 3	− 9	− 1	− 1	+ 0	− 4	− 2	− 3	+24	+ 4	1	−0.07
94318	19 11 50.30	−70 48 24.4	9.36	H	287.959 564 33	−70.806 778 51		0.28	7.80	−1.98	0.57	0.87	1.26	0.75	1.00	−20	−14	− 3	+18	−10	−13	−11	+ 6	+ 7	−30	2	−1.03
94319	19 11 50.57	+08 42 18.7	9.97	H	287.960 712 17	+08.705 205 93	A	1.33	0.85	−5.84	4.62	3.06	3.89	4.57	2.98	+ 6	− 6	−16	−27	+ 1	− 4	− 1	−30	+24	+ 4	1	−0.07
94320	19 11 52.19	−20 22 51.2	8.36	H	287.967 456 19	−20.380 887 80		2.72	−7.04	−2.58	0.98	0.56	1.08	1.29	0.75	− 8	− 3	− 3	+15	− 4	+34	− 7	−32	−17	−21	2	0.19
94321	19 11 53.34	+14 34 56.1	8.05	H	287.972 257 05	+14.582 240 63		2.50	2.58	−10.03	0.60	0.60	0.95	0.66	0.69	+31	−17	− 4	+23	−22	+11	−26	− 8	+ 4	+22	0	−0.22
94322	19 11 53.36	−44 34 13.0	10.15	H	287.972 335 96	−44.570 291 03		8.48	−35.58	−113.22	1.59	1.01	1.82	1.79	1.29	+16	−41	−12	−26	+18	+ 7	+17	−41	+ 5	+13	0	0.70
94323	19 11 54.96	−14 35 04.4	7.04	G	287.979 014 50	−14.584 562 45		2.94	51.08	6.06	0.79	0.50	0.94	0.88	0.58	+18	−32	−10	−11	− 5	+36	− 5	−33	+ 2	+ 6	0	−1.39
94324	19 11 56.51	+43 53 25.9	8.01	H	287.985 457 13	+43.890 524 95		2.65	2.14	−0.79	0.58	0.61	0.66	0.59	0.79	− 3	+ 8	− 3	+13	+23	− 1	+28	+18	+10	+ 5	3	−0.57
94325	19 11 56.86	−46 08 40.5	8.02	H	287.986 899 66	−46.144 583 06		3.79	−20.68	−11.91	1.12	0.85	1.43	1.62	1.17	+17	− 2	−37	−36	+21	−36	+ 8	−54	+30	− 4	0	0.42
94326	19 11 57.30	−39 30 00.9	8.80	H	287.988 748 43	−39.500 242 33		21.37	88.74	−102.48	1.29	0.79	1.45	2.11	1.07	+ 1	−12	−24	+15	+30	−42	+ 5	−36	+35	−41	0	0.47
94327	19 11 57.47	+22 07 22.7	9.08	H	287.989 449 37	+22.122 962 72		−0.44	1.77	1.33	0.74	0.89	1.24	1.01	1.06	+23	−13	+ 0	+20	+12	+17	+ 8	+11	+22	+29	0	0.79
94328	19 12 00.32	+39 25 14.6	7.50	H	288.001 317 95	+39.420 736 01		5.17	9.15	11.53	0.52	0.53	0.63	0.61	0.68	− 2	+ 4	− 3	+15	+ 9	−12	+10	+16	− 4	+ 2	0	0.63
94329	19 12 00.48	−30 16 13.1	10.43	H	288.001 992 90	−30.270 310 50		2.51	7.08	−1.70	2.25	1.24	2.81	3.71	1.91	+19	−22	− 3	− 6	+ 0	−54	−20	−61	+20	−20	4	0.09
94330	19 12 02.85	+07 55 46.8	9.84	H	288.011 858 21	+07.929 663 91		0.48	−1.60	−4.90	1.33	0.98	1.61	1.46	1.14	+24	−36	−24	− 4	+ 2	+ 3	− 9	−24	+21	− 9	2	0.47
94331 H	19 12 03.28	+02 37 21.4	6.94	H	288.013 660 99	+02.622 616 58	*	4.35	−3.30	−10.44	1.28	0.77	1.07	1.02	0.82	+ 6	−24	− 2	−19	+ 4	− 2	+ 3	−27	+ 8	+13	1	0.22
94332	19 12 03.94	−31 12 21.3	9.12	G	288.016 434 70	−31.205 927 04		5.42	0.89	−12.97	1.60	0.74	1.65	1.84	1.17	+10	−40	− 4	+ 6	+ 3	−15	−15	−51	+17	−14	0	0.16
94333	19 12 04.19	−23 44 25.8	8.02	G	288.017 461 98	−23.740 509 91		−0.07	−1.82	−8.31	1.04	0.54	0.99	1.32	0.81	−31	− 4	−11	−30	+33	− 7	+30	−57	+18	−39	0	−0.43
+94334	19 12 04.87	−43 55 27.2	10.19	G	288.020 286 12	−43.924 228 35		4.36	5.06	−5.76	1.61	1.17	1.98	2.13	1.54	+ 9	−16	−20	−23	+29	−14	+21	−49	+19	− 5	0	−1.25
+94335	19 12 04.86	+46 19 26.5	9.35	2 H	288.020 260 65	+46.324 018 65		7.69	−0.82	45.43	0.75	0.71	0.89	0.88	0.75	+ 5	−19	+18	+ 5	+ 8	−17	+16	−14	−19	+28	3	−0.87
+94336 H	19 12 05.22	+49 51 15.3	5.85	G	288.021 731 47	+49.854 238 07	A	40.16	−205.02	624.33	0.99	0.92	0.83	0.97	0.89	− 1	−24	+12	+12	+ 3	− 3	+ 5	+ 1	+ 3	+10	7	1.21
+94337	19 12 05.10	+69 42 28.5	9.00	H	288.021 240 72	+69.707 914 48		5.81	8.31	8.77	0.65	0.58	0.65	0.77	0.69	+10	−19	− 1	+ 9	+ 3	− 6	+ 2	+ 4	+ 0	+12	0	−0.44
94338 H	19 12 05.81	−21 55 41.7	7.83	H	288.024 221 48	−21.928 241 09	A	3.42	5.85	−5.95	1.98	1.09	1.87	1.80	1.31	+ 1	− 1	−10	− 4	− 7	+ 4	+ 1	−34	+25	+35	2	0.23
94339	19 12 06.30	−50 14 38.2	8.02	H	288.026 262 65	−50.243 956 33		0.81	15.62	−34.94	0.84	0.60	0.94	1.13	0.66	− 2	−18	− 8	− 3	+20	+ 7	+15	−33	− 6	−15	0	−0.03
94340	19 12 06.47	−28 29 05.8	9.49	H	288.026 951 21	−28.484 941 29		12.86	−18.38	−87.28	1.98	0.76	2.02	1.95	1.09	+ 0	−63	− 4	+ 7	+12	−15	− 8	−50	+14	−27	2	1.25
94341	19 12 08.15	+24 07 48.2	11.22	G	288.033 953 64	+24.130 060 36		29.35	−119.82	−197.53	1.78	2.07	3.13	2.33	2.56	− 8	−12	− 3	−22	− 8	+ 2	− 9	−23	+12	+ 0	0	
94342	19 12 08.38	+36 09 46.4	8.78	H	288.034 905 56	+36.162 886 37		3.01	1.84	−2.13	0.63	0.69	0.82	0.71	0.79	− 8	+ 8	−11	+13	+17	−18	+16	+10	− 2	− 7	1	−0.02
94343	19 12 09.52	+41 50 15.5	8.20	H	288.039 675 39	+41.837 647 01		5.79	17.57	−15.61	0.63	0.64	0.76	0.67	0.88	− 9	−28	+ 4	− 6	+ 2	+ 6	+ 3	+26	+ 4	−13	0	−1.19
+94344	19 12 09.78	−37 34 59.1	6.55	G	288.040 738 35	−37.583 090 57		2.37	5.47	−5.95	0.83	0.47	0.85	1.09	0.60	+ 1	−32	+ 8	+26	− 1	+ 1	−10	−35	−11	−21	0	1.30
+94345	19 12 09.72	−16 25 49.4	8.02	G	288.040 497 17	−16.430 379 03		6.76	−15.54	−45.00	0.92	0.56	1.00	0.98	0.64	+ 1	−26	− 6	− 6	+ 2	+ 8	+ 3	−33	+ 7	+ 5	0	0.09

Figure 1. Example extracts from the printed version of the Hipparcos Catalogue – above: a typical 'left-hand' page; opposite: the corresponding 'right-hand' page.

in many cases period and variability type classification could be undertaken.

2. ASTROMETRIC AND PHOTOMETRIC OVERVIEW

The standard astrometric model adopted for single stars assumes uniform rectilinear space motion relative to the solar system barycentre. At some reference epoch, T_0, the stellar motion is then described by the following five astrometric parameters (the third component of the space velocity, the radial velocity, being undetermined from the Hipparcos observations): the barycentric coordinate direction (α, δ); annual parallax, π, from which the coordinate distance is $(\sin\pi)^{-1}$ AU or, with sufficient approximation, π^{-1} pc if π is expressed in arcsec; and the rate of change of the barycentric coordinate direction expressed as proper motion components $\mu_{\alpha*} = \mu_\alpha \cos\delta$ and μ_δ, in angular measure per unit time (the $\cos\delta$ factor, signified by the asterisk in $\mu_{\alpha*}$, relates the rate of change of position in RA to great-circle measure).

These five astrometric parameters are given for almost all stars in the catalogue. Systems which could not be described by these five parameters were classified into five parts of the Double and Multiple Systems Annex: (C) component solutions, in which two or more components were resolved and their absolute and relative astrometry (and photometry) were reconstructed; (G) 'acceleration' solutions, in which the photocentric motion contains non-linear time-dependent terms; (O) orbital systems, for which (partial) orbital solutions could be derived, possibly in combination with ground-based observations; (V) 'variability-induced mover' solutions, in which binarity was inferred from a time-dependent photocentric displacement; and (X) 'stochastic' solutions, in which multiplicity was evident yet uncharacterised. Further details are given by Lindegren et al. (1997).

The Hipparcos Catalogue includes a variety of accurate and homogeneous photometric information for each star, in particular: the Johnson V magnitude, accurate to typically 0.01 mag, and derived from a combination of satellite and ground-based photometry; broad-band Hipparcos, or Hp, magnitudes, in an instrument specific passband, providing the most accurate multi-epoch photometric data most suitable for variability studies (the median photometric precision for $Hp < 9$ mag is approximately 0.0015 mag); two-colour B_T and V_T magnitudes derived from the Tycho (star mapper) observations; and Johnson B–V and Cousins' V–I colour-indices, again derived from a combination of satellite and ground-based measurements. The mean number of photometric observations per star over the three-year observational period is 110, providing data for detailed variability classification and characterisation. The principal photometric characteristics and variability statistics are given by van Leeuwen et al. (1997).

No.	Tycho Magnitudes					Colour Indices						Magnitude (Hp)					Variability (Hp)				Multiplicity Data									Misc
HIP	B_T mag	σ mag	V_T mag	σ mag		B–V mag	σ mag		V–I mag	σ mag		Hp mag	σ mag	s mag	N		Max mag	Min mag	P days		CCDM		Flags	AB	θ °	ρ ″	σ_ρ ″	ΔHp mag	σ mag	Flags
31	32	33	34	35	36	37	38	39	40	41	42-3	44	45	46	47	48	49	50	51	52-4	55	56-7	58-61	62	63	64	65	66	67	68-70
94301	9.612	0.015	9.360	0.018		0.240	0.022	T	0.27	0.03	L	9.3896	0.0019	0.021	145		9.35	9.44					1							
94302	6.422	0.004	5.246	0.002		1.008	0.003	T	0.98	0.00	L	5.2950	0.0007	0.005	100		5.29	5.30					1							S
94303	11.176	0.075	10.652	0.083		0.710	0.020	G	0.76	0.02	H	10.8155	0.0029	0.031	84		10.76	10.86		C			1							G
94304	8.029	0.008	7.629	0.008		0.391	0.009	T	0.46	0.01	L	7.6877	0.0011	0.013	128		7.66	7.71					1							S
94305	9.070	0.014	8.530	0.013		0.506	0.017	T	0.58	0.02	L	8.5541	0.0025	0.019	86		8.52	8.59					1							
94306	8.420	0.012	8.159	0.013	A	0.108	0.140	G	0.22	0.03	L *	8.1913	0.0018	0.015	112	*	8.17	8.22		C	19117+1753	I 1	2 C	B	AB	84	1.949	0.039	3.51	0.15	
94307	10.216	0.032	9.665	0.031	A	0.522	0.033	T	0.59	0.04	L	9.7764	0.0142	0.022	85	A	9.75	9.81		C	19117−4711	I 1	2 C	D	AB	152	13.901	0.063	3.37	0.32	D
94308	8.070	0.007	7.733	0.008	A	−0.016	0.009	G	0.01	0.01	H	7.8045	0.0066	0.029	196	A	7.76	7.86		D	19118+2615	I 1	2 C	A	AB	23	15.113	0.013	2.48	0.06	S
94309	9.187	0.014	8.246	0.011		0.817	0.014	T	0.84	0.01	L	8.2891	0.0026	0.023	107		8.25	8.33		U 2	19118−1911	I 1	1							
94310	9.749	0.024	9.027	0.020	*	0.649	0.023	T	0.71	0.02	L *	9.0311	0.0033	0.024	76	*	8.99	9.07		D	19118−5319	I 1	2 C	A	AB	182	0.438	0.007	1.33	0.04	
94311	5.851	0.003	5.924	0.003		−0.062	0.004	T	−0.04	0.00	L	5.9180	0.0013	0.012	130		5.90	5.93		U 2			1							S
94312											T	12.5469	0.0137	0.141	104		12.06	12.73		U			1	S						D
94313	8.052	0.008	7.667	0.008		0.411	0.001	G	0.48	0.00	H	7.7107	0.0018	0.015	145		7.69	7.74					1							S
94314	10.824	0.046	9.432	0.024		1.177	0.041	T	1.14	0.04	L	9.4339	0.0038	0.022	74		9.38	9.48					1							G
94315	9.010	0.013	8.814	0.016		0.187	0.019	T	0.21	0.02	L	8.8400	0.0017	0.016	115		8.81	8.88		C			1							
94316	9.425	0.018	8.067	0.011		1.150	0.017	T	1.11	0.01	L	8.0831	0.0014	0.011	68		8.06	8.11		C			1							
94317	11.916	0.165	10.806	0.092	B	0.957	0.147	T	0.94	0.11	L	11.4548	0.1277			B				D	19118+0842	I 2	1 C F D							D
94318	9.350	0.010	9.343	0.013		0.007	0.014	T	0.03	0.01	L	9.3715	0.0018	0.026	237		9.32	9.43					1							
94319	10.517	0.044	9.985	0.046	A	0.499	0.058	T	0.57	0.06	L	10.0790	0.0445	0.041	77	A	9.94	10.13		D	19118+0842	I 2	1 C P D							G D
94320	9.764	0.022	8.501	0.013		1.076	0.020	T	1.04	0.02	L	8.5268	0.0021	0.016	93		8.49	8.56					1							
94321	8.014	0.007	8.049	0.009		−0.027	0.010	T	−0.01	0.01	L	8.0475	0.0013	0.013	135		8.03	8.06		C			1							
94322	11.184	0.061	10.276	0.046		0.791	0.059	T	0.82	0.04	L	10.2922	0.0038	0.027	99		10.25	10.35		C			1							G
94323	8.890	0.015	7.176	0.007		1.431	0.013	T	1.48	0.02	A	7.1618	0.0012	0.008	82		7.15	7.17					1							S
94324	8.021	0.007	8.006	0.008		0.019	0.010	T	0.04	0.01	L	8.0282	0.0015	0.011	121		8.01	8.05		C			1							S
94325	9.607	0.019	8.160	0.011		1.220	0.017	T	1.18	0.02	L	8.1787	0.0024	0.016	87		8.16	8.21					1							S
94326	9.631	0.036	8.886	0.030		0.667	0.036	T	0.73	0.03	L	8.9326	0.0022	0.016	72		8.91	8.96		C			1							
94327	9.328	0.015	9.138	0.018		0.182	0.022	T	0.20	0.03	L	9.1415	0.0023	0.026	134		9.10	9.19		C			1							
94328	7.578	0.007	7.510	0.007		0.068	0.009	T	0.08	0.01	L	7.5329	0.0011	0.011	120		7.51	7.55					1	S						S
94329	11.618	0.094	10.512	0.053		1.050	0.020	G	1.02	0.02	H	10.5970	0.0040	0.029	109		10.53	10.63					1							G
94330	10.129	0.028	9.816	0.032		0.297	0.040	T	0.34	0.05	L	9.9123	0.0022	0.018	76		9.88	9.95		C			1							G
94331	7.064	0.005	6.955	0.006	*	0.102	0.003	G	0.12	0.00	R *	6.9845	0.0015	0.010	76	*	6.97	7.01		D	19121+0237	I 1	2 C	A	BA	184	0.248	0.003	0.48	0.05	S
94332	9.791	0.022	9.178	0.020		0.574	0.020	G	0.65	0.02	H	9.2481	0.0016	0.020	115		9.20	9.28					1	S						
94333	7.987	0.007	8.033	0.009		−0.018	0.015	G	0.00	0.01	H	8.0220	0.0010	0.010	118		8.01	8.05		C			1							S
94334	10.707	0.037	10.165	0.035		0.481	0.005	G	0.55	0.01	H	10.3138	0.0026	0.031	105		10.26	10.38					1							G
94335	10.016	0.025	9.395	0.022		0.574	0.025	T	0.65	0.02	L	9.4722	0.0034	0.045	101		9.43	9.67	2.18	P 1 A			1							
94336	7.294	0.007	6.569	0.006	A	0.666	0.006	G	0.73	0.01	R *	5.9819	0.0008	0.009	109	*	5.97	6.00		D	19121+4951	I 1	2 C	A	AB	208	7.648	0.003	0.15	0.01	S
94337	9.348	0.016	9.038	0.017		0.337	0.015	G	0.39	0.02	H	9.0852	0.0010	0.015	116		9.06	9.12		D			1							
94338	9.375	0.014	7.994	0.008	A	1.000	0.495	G	1.09	0.05	L *	7.9990	0.0012	0.012	128	*	7.98	8.02		D	19121−2156	I 1	2 C	B	AB	330	7.565	0.049	3.71	0.32	
94339	9.899	0.027	8.183	0.012		1.440	0.001	G	1.44	0.00	H	8.1295	0.0013	0.012	90		8.11	8.15		C			1							
94340	10.424	0.031	9.576	0.024		0.760	0.020	G	0.80	0.02	H	9.6322	0.0022	0.021	104		9.60	9.67		C			1							
94341						1.410	0.020	G	1.70	0.05	I	11.3476	0.0041	0.054	193		11.25	11.43					1 X							G
94342	8.764	0.011	8.785	0.014		−0.015	0.016	T	0.01	0.01	L	8.7802	0.0015	0.016	131		8.75	8.82					1							
94343	8.541	0.010	8.232	0.011		0.296	0.003	G	0.34	0.00	H	8.2745	0.0018	0.015	110		8.25	8.30					1							
94344	7.821	0.007	6.682	0.006		1.016	0.000	G	0.99	0.00	H	6.7166	0.0008	0.007	83		6.71	6.73		C			1							S
94345	8.711	0.011	8.089	0.010		0.596	0.015	G	0.67	0.01	H	8.1352	0.0010	0.012	93		8.12	8.17		D			1							S

3. CATALOGUE PRODUCTS

The Hipparcos Catalogue is available as a 17-volume publication, ESA SP–1200. This includes the main Hipparcos Catalogue, the Double and Multiple Systems Annex, the Variability Annex, identification charts for faint objects or objects in crowded regions, light curves for periodic and unsolved variables, and a full sky star atlas with nearby, variable, high proper motion, and multiple systems indicated. All products of the mission, including intermediate astrometric data and the catalogues of epoch photometry, are also provided on 6 ASCII CD-ROMs included within the 17-volume publication.

The main Hipparcos Catalogue appears in printed form as Volumes 5–9 of ESA SP–1200. The corresponding catalogue is given in PDF form on the ASCII CD-ROMs, and appears in ASCII form, with a search and read routine given in C, and procedures to convert to FITS format, also given on the ASCII CD-ROMs.

4. CONTENTS OF THE HIPPARCOS CATALOGUE

The various forms of the main catalogue (printed, PDF, and machine-readable) are all organised in the same manner, with a detailed description of the fields, and their interpretation, given in Volume 1 of the catalogue. The information on each entry is organised as follows (see also Figure 1):

4.1. Fields H1–30 (Left-Hand Pages)

Field H1. The Hipparcos Catalogue, or HIP, identifier (the same as the HIC, or Hipparcos Input Catalogue identifier). The printed catalogue is ordered according to increasing HIP number, with * preceding the number implying that the entry is out of order with respect to its right ascension (ICRS, catalogue epoch J1991.25).

Field H2. A 'proximity flag', derived from nearby HIP or TYC entries; the flag indicates that caution is needed in using it as an astrometric reference.

Fields H3–4. Sexagesimal identifier: provided 'for information' and derived from the definitive position. The epoch is J1991.25, and the reference system is ICRS.

Fields H5–7. Johnson V magnitude, variability flag, and source of magnitude. These provide an indication of magnitude and possible variability, derived from information given in other fields.

Fields H8–9. The Hipparcos position, at epoch J1991.25, within the ICRS reference system.

Field H10. If the entry is double, a flag in this field indicates whether the astrometric data in these (and subsequent) fields refer to a component or photocentre, or (rarely) the centre of mass for an orbital system.

Field H11. The Hipparcos parallax in milliarcsec (negative values arise from measurement errors).

Table 1. Principal observational characteristics of the Hipparcos Catalogue. Reference system quantities apply about all three axes. The limiting magnitude is dependent on galactic latitude and spectral type.

Measurement period	1989.85–1993.21
Catalogue epoch	J1991.25
Reference system	ICRS
coincidence with ICRS	±0.6 mas
deviation from inertial	±0.25 mas/yr
Number of entries	118 218
with associated astrometry	117 955
with associated photometry	118 204
Mean sky density	~ 3 stars deg^{-2}
Limiting magnitude	$V \sim 12.4$
Magnitude completeness	$V = 7.3 - 9.0$

Fields H12–13. The Hipparcos proper motion, at epoch J1991.25, in milliarcsec per year, both components expressed in great-circle measure.

Fields H14–18. The standard errors of the five primary astrometric parameters: position, parallax, and proper motion components, respectively.

Fields H19–28. The correlation coefficients between the five astrometric parameters.

Fields H29–30. Statistical indicators of the quality of the astrometric solution: percentage of data rejected from the final astrometric model, and resulting (gaussianised) goodness-of-fit, respectively.

4.2. Fields H31–70 (Right-Hand Pages)

Field H31. This is a repeat of the HIP identifier, as Field 1, appropriate for the printed catalogue where the information for each entry spans two printed pages. Field T31 (the corresponding field of the Tycho Catalogue) gives the cross-identification between HIP and TYC for Tycho Catalogue entries.

Fields H32–36. Photometry from Tycho Catalogue: mean magnitudes, corrected for 'censored' data. Entries without Tycho photometry are blank.

Fields H37–39. Johnson B–V colour index, from Tycho photometry (transformed using spectral type) or from ground if Tycho photometry was unavailable or imprecise. Values do not necessarily correspond to B–V for the same entry in the Tycho Catalogue.

Fields H40–43. Cousins' V–I colour index and related information, from various sources.

Fields H44–48. Median Hipparcos magnitude in the broad-band Hp system, derived from the Hipparcos Epoch Photomety Annex.

Fields H49–52. Magnitudes at maximum and minimum luminosity (in Hp) derived from the 5th and 95th percentiles of the epoch photometry. Period (truncated precision) and type of variability are given for identified variables.

Fields H53–54. 1–2 in Field H53 points to tabular data for periodic and unsolved variables giving further details of the variability, variable star name, period and epoch, references to literature, etc. A–C in Field H54 points to the light curves (Volume 12 of the printed catalogue).

Fields H55–57. CCDM number assigned to double or multiple systems. Also given are the origin of the CCDM identifier, and the number of catalogue entries with the same CCDM number.

Fields H58–61. Classification of the double or multiple star solution, and pointers to relevant sections of the Double and Multiple Systems Annex.

Fields H62–67. Summary of the astrometric and photometric parameters of a double system, when the Hipparcos observations resolve the system into precisely two components.

Fields H68–70. Flags indicating 'survey' star, identification chart, or note on the entry: the note flag may point to notes at the end of Volumes 5–9, or for double and multiple systems (Volume 10) or for variables (Volume 11).

4.3. Fields H71–77

The machine-readable version of the catalogue includes seven additional fields not in the printed catalogue (Fields H71–77) providing cross-identifications to the HD and DM Catalogues, and the spectral type and source of the spectral type, all of these being compiled from SIMBAD or other sources.

ACKNOWLEDGMENTS

The Hipparcos Catalogue is the primary result of the Hipparcos space astrometry mission, undertaken by the European Space Agency, with the scientific aspects undertaken by nearly two hundred scientists within the NDAC, FAST, TDAC and INCA Consortia. The efforts of the many individuals and organisations participating in the Hipparcos project over many years have been an essential component of the project's successful completion. This summary of the Hipparcos Catalogue contents is compiled from material included in Volume 1 of the published catalogue, and correspondingly represents the final products of the NDAC and FAST Consortia, led by L. Lindegren and J. Kovalevsky respectively.

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