THE ASTRONOMICAL JOURNAL VOLUME 108, NUMBER 6 DECEMBER 1994

ICCD SPECKLE OBSERVATIONS OF BINARY STARS. XI. MEASUREMENTS DURING 1991–1993 FROM THE KITT PEAK 4 m TELESCOPE

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(Received 1994 May 12; revised 1994 July 26)

ABSTRACT

One-thousand one-hundred ninety-seven observations of 730 binary star systems, observed by means of speckle interferometry with the 4 m telescope on Kitt Peak, are presented. Included in these binary stars are new interferometric companions to five visual binaries. These measurements, made mostly during the period 1991 to 1993, comprise the 11th installment of results stemming from our speckle program at the 4 m class telescopes on Kitt Peak, Cerro Tololo, and Mauna Kea.

1. INTRODUCTION

This paper is the 11th in our current series of reports on the continuing effort to provide high accuracy, high angular resolution measurements of binary star systems by speckle methods. We here present measurements from the KPNO 4 m telescope, obtained mainly during 1991 April/May, 1991 November, 1992 April, and 1993 March. The data published in this and in our previous series of speckle measurements comprise over 80% of all published interferometric measurements of binary stars.

2. NEW MEASUREMENTS

Our basic ICCD speckle camera remained identical to that described earlier in this series (see McAlister *et al.* 1987), and all data were reduced utilizing the "directed vector autocorrelation" algorithm described by Bagnuolo *et al.* (1992). Absolute calibration of our results was made using a double-slit pupil mask, as described by McAlister *et al.* (1987). An independent θ calibration for each run was determined by trailing a star across our acquisition field with the telescope drive off.

The GSU speckle camera was scheduled for a total of 17 nights during these four KPNO runs. One full night and a few partial nights were lost to clouds and/or poor seeing, but in the remaining time we were able to obtain nearly 3700 observations. Some of these observations, made of stars in the Hyades, Pleiades, and IC 4665 clusters, have already been published in Papers VII and X in this series (see Mason *et al.* 1993a, b). After removing these stars, plus observations of calibration objects and unresolved stars, and after averaging observations of stars observed using more than one filter, we are left with 1162 observations. Added to this are 16 other ICCD measurements and 12 unresolved measures made between 1982 and 1990, as well as 7 unresolved measures made with a photographic speckle camera on the KPNO 2.1 m telescope between 1976 and 1979 (see McAlister *et al.* 1984 and references therein). These bring the totals reported here to 1197 observations of 730 stars.

Five newly discovered companions, each an additional component to a known binary system, are included in these totals. Table 1 gives a brief description of these systems and an estimate of their orbital periods. In determining these periods, circular orbits at the discovery separation are assumed and both components are assumed of equal brightness and mass [based on spectral type and estimated from tables in Allen (1973)]. Distances are derived from V and spectral type or, in the case of the nearby star BD+39 2376, from a parallax value given by Woolley *et al.* (1970).

The new measurements of binary stars are presented in Table 2, (this table is presented in its complete form in the ApJ/AJ CD-ROM Series, Vol. 3, 1994), where we use the same condensed format of previous papers in this series. The coordinates in Table 2, which also serve as the *Washington Double Star Catalog* (WDS) number, are for equinox 2000.0, but position angles have not been corrected for precession

TABLE 1. New multiple star components.

α,δ (2000)	ADS	CHARA Number	HD/BD	V	Spectral Type	Discovery Epoch	Discovery Separation	P_{est} (yrs)
08095+3213	6623	190 Aa	67501	6.7	F2	1991.3210	0".148	120
10453+3831	7915	191 Aa	+39 2376	9.23	dM2	1983.4277	0.381	25
11150+3735	8102	192 Aa	97731	8.2	G5	1987.2666	0.093	30
13197+4747	8862	193 Aa	115953	8.54	K0	1992.3126	0.109	25
17215+2845		194 Aa	157358	6.35	GOIII	1991.3247	0.052	90

[1]Visiting Astronomer, Kitt Peak National Observatory, National Optical Astronomy Observatories, operated by the Association of Universities for Research in Astronomy, Inc., under contract with the National Science Foundation.

 0004-6256/94/108(6)/2299/13/$0.90

and are thus based upon the equinox for the epoch of observation, shown as the fraction of the Besselian year. Angular separations are given in seconds of arc, position angles in degrees. Accuracies are of course a function of stellar magnitude, magnitude difference, separation, and observing conditions; typical values for these observations are 1–3 mas in ρ and 0°.1–0°.2 in θ. Colons following θ or ρ values indicate measurements of somewhat reduced accuracy, usually the result of observing fainter systems or systems of larger magnitude difference. Short notes on some of these stars follow Table 2; stars having notes are flagged by an asterisk following their ρ measure.

TABLE 2. Binary star speckle measurements.*

WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (o)	ρ ('')
00020+2706	Bu 733 AB	224930	91.8934	100.3	0.651
00062+5826	STF 3062 AB	123	91.9015	312.4	1.465
00104+5831	Bu 253	570	91.9015	34.4:	0.501:
00122+5337	Bu 1026 AB	761	91.8934	278.6	0.182
			91.9016	279.0	0.181
00152+4406	A 1256 AB	1082	91.9016	78.0	0.068
00173+0852	A 1803 AB	1317	91.8934	126.2	0.170
00243+5201	Hu 506	1976	91.9016	55.9	0.154
00245+5632	A 908	236401	91.9016	237.0	0.431
00283−2020	B 1909	2475	91.8934	298.6	0.201
00287+3718	A 1504 AB	2471	91.9016	38.7	0.557
00308+4732	Bu 394	2675	91.8934	97.2:	0.105:
			91.9016	96.8	0.102
00318+5432	STT 12	2772	91.9016	190.5	0.443
00320+2740	Cou 547	2854	91.8934	213.1	0.118
00335+4006	Ho 3	2993	91.9016	104.4	0.274
00352−0336	Ho 212 AB	3196	91.8934	278.2	0.286
00358+4901	STT 15	3210-1	91.9016	320.1	0.216
00372−2446	Bu 395	3443	91.8934	115.0	0.695
00402+4715	Bu 257	3700	91.9016	247.4	0.644
00405+3627	Cou 1051	3742	91.9016	82.4	0.449
00444+6210	MLR 26	4116	91.9015	49.5	0.212
00491+5720	A 921 AB	236538	91.9043	159.8	0.147
00504+5038	Bu 232 AB	4777	91.9043	243.4	0.863
00507+6415	McA 2	4775	91.8934	344.1:	0.062:
00512+6019	MLR 27	236553	91.9043	209.3	0.443
00516+2238	A 1808	4934	91.8936	184.0	0.132
00532+0406	A 2307	5143	91.8961	49.4	0.278
00546+1912	STT 20 AB	5267	91.8961	202.9	0.488
00549+4924	Hu 802	5259	91.9043	217.1	0.353
00550+2338	STF 73 AB	5286	91.8936	291.2	0.753
00568+6022	Bu 1099 AB	5408	91.8934	334.3	0.271
			91.9043	334.0	0.274
00576+5424	HLD 4	5502	91.9043	293.8	0.102
00583+2124	Bu 302	5641	91.8961	173.0	0.403
01015+6921	A 2901	5839	91.8934	55.8	0.417
01029+5148	Bu 1161	6084	91.9043	8.4	0.363
01036+6341	MLR 87	6129	91.8934	79.2	0.308
			91.9043	78.4	0.308
01037+5026	Hu 517	6194	91.9043	26.7	0.568
01039+3528	Ho 213	6264	91.8960	102.1	0.300
01071+3839	A 1516 AB	6586	91.8934	113.6	0.118
01093+4715	STT 515	6811	91.9044	131.1	0.492
01096+2348	Bu 303	6886	91.8960	292.1	0.644
01100+5153	Hu 519	232385	91.9043	129.9	0.368
01106+5101	Bu 235 Aa	6918	91.9043	129.2	0.965
01151+3416	Hu 803	+33 0193	91.8962	207.8	0.869
01157+5918	A 935	7432	91.9017	359.5	0.267
01178+4946	Hu 520	7695	91.9016	165.4	0.322
01178+4901	STF 102 AB	7710	91.9016	277.7	0.484
01181+4707	A 937	7759	91.8962	218.6:	0.296:
01187+3245	Cou 663	7854	91.8962	175.1	0.335
01194+4857	Hu 521	7881	91.9016	289.6	0.287
01198−0029	Fin 337 BC	8036	91.8936	328.2	0.093
01233+5808	STF 115 AB	8272	91.9017	227.8	0.059
01243−0655	Bu 1163	8556	91.8961	220.3	0.254
01258+2733	Cou 666	+26 0235	91.8962	153.3	0.337
01280+5821	A 940	236745	91.9017	83.0	0.567
01296+2250	A 1910 AB	9071	91.8936	250.2	0.094
01298+4547	Cou 1659	9031	91.8962	25.4	0.312
01334+5820	McA 3	9352-3	91.8936	111.7	0.112
01342+3611	A 1912 AB	9532	91.8962	2.6	0.189
01357+6409	MLR 103	9570	91.9017	104.4	0.353
01357+7226	A 816	9454	91.9017	308.9	0.830
01371+4843	A 817	9841	91.8962	27.9	0.477
01373+4015	Cou 1214	+39 0367	91.8962	175.6	0.315
01376−0924	Kui 7	10009	91.8936	157.7	0.209
01392+5436	A 1266	10031	91.9016	237.1	0.192
01405+5457	A 1267	10146	91.9016	4.4	0.272
01415+6240	Kr 12	10196	91.9017	294.1	0.407
01425+5000	B 2550 AB	+49 0441	91.9016	276.9	0.227
01449+1951	A 2322	+19 0281	91.8962	110.6	0.077
01450+2703	Cou 750	+26 0287	91.8962	174.1	0.112
01465+2936	Cou 451	+28 0295	91.8962	70.4	0.269
01472+4212	A 1523	+41 0342	91.8962	64.7	0.399
01492+4754	CHARA 4A a	11031	91.8936	233.3	0.138
01512+6021	A 951	11126	91.9019	218.9	0.451
01512+2439	Ho 311	11284	91.8936	333.0	0.159
01547+5955	A 953	11472	91.9019	65.9	0.806
01551+2847	STF 183 AB	11671	91.8936	164.5	0.320
01563+4251	A 1524 AB	11748	91.9044	235.8	0.341
01570+3101	A 819 AB	11849	91.8936	218.5	0.267
01573+4812	A 818	11826	91.9044	205.2	0 300
01576+4433	A 1526	11869	91.9044	245.9	0.105
02016+4107	Cou 1510	+40 0426	91.9044	132.1	0.376
02019+7054	Bu 513 AB	12111	91.8936	238.4	0.828
02021+4530	Cou 1665	+44 0407	91.9044	104.7	0.501
02022+3643	A 1813 AB	12376	91.8936	224.6	0.100
			91.9044	224.7	0.098
02026+0905	McA 4	12483	91.8936	144.4	0.223
02039+4220	STT 38 BC	12534	91.8936	106.7	0.555
			91.9044	107.2	0.554
02043+3924	Cou 1365	12592	91.9044	129.7	0.193
02107+4426	Cou 1667	+43 0436	91.9044	66.7	0.145
02128+3722	Ho 497	13496	91.9044	83.4	0.529
02141+4729	STF 228	13594	91.9044	276.5	1.058
02145+6631	McA 6	13474	91.8936	180.2	0.066
02157+2503	Cou 79	13872	91.8936	36.0	0.188
			93.2047	34.4:	0.188:
02160+4046	Cou 1669	13844	91.9044	172.6	0.210
02183+4120	Cou 1670	14137	91.9044	43.1	0.142
02186+4017	Egg 2 Aa	14189	91.9044	135.1	0.220
02231+7021	MLR 377	14382	91.9017	149.4	0.625
02257+6133	STF 257	14817	91.9019	56.7	0.361
02277+0426	A 2329	15285	91.8937	92.3	0.351
02279+4523	Cou 2011	15174	91.9044	68.0	0.358
02366+1226	McA 7	16234	82.7659	27.9	0.040 *
			84.7046	23.7	0.036
			88.6554	5.5	0.046
02383+4604	A 1278	16283	91.8937	144.3	0.123
02393+2552	A 2023	16486	91.8964	227.2	0.577
02396−1153	Fin 312	16620	91.8937	259.5	0.116
02415+4053	Cou 1511	16656	91.8937	4.9	0.105
02422+4012	McA 8	16739	91.8937	156.1	0.052
02520+4831	Cou 2013	17670	91.8937	96.2	0.212
02537+3820	Bu 524 AB	17904	91.8937	244.7	0.165
			91.9019	244.2	0.165
			93.2047	233.6	0.149
02586+2408	Bu 1173 AB	18442	91.8964	91.8	0.231
02589+2137	Bu 525	18484	91.8964	263.0	0.522
02592+2120	STF 333 AB	18519-0	91.8964	208.0	1.460
03006+4753	A 1529	18549	91.8937	164.8	0.220
			91.9019	165.3	0.222
03048+5330	γ Per	18925	93.2020	68.8	0.115
03062+4342	Bu 1175	19091-2	91.9019	274.4	0.635
03143+1821	Cou 359	+17 0515	91.8965	171.3	0.159
03271+1845	CHARA 10	21335	90.7551	221.8:	0.065:
			91.8938	250.0	0.075
03280+2028	Cou 260	21437	91.8964	22.6	0.240
03337+5752	CHARA 117	21794	91.8937	23.3	0.087
			91.9019	23.0	0.084
03361+4221	A 1535	22193	91.9019	324.9	0.675
03364+4518	Cou 1862	22209	91.9019	16.4	0.314
03461+6321	McA 12	23089	93.2047	359.2	0.054
03483+2223	Bu 1184	23743	91.9047	270.6	0.492
03489+1143	A 831	23874	91.9047	24.0	0.338
03504+2536	STT 65	23985	91.9045	213.2	0.232
03513+2621	A 1830	24104	91.9045	192.6	0.216
03519+0633	Kui 15	24263	91.9047	207.1	0.707
03520+2801	Cou 696	282993	91.9044	48.3	0.219
03521+4048	STT 66	24117	91.9044	144.4	0.983
03545+0511	A 1881 BC	+04 0600	91.9047	20.9	0.129
04136+0743	A 1938	26690	90.7552	123.2:	0.066
			91.8939	164.9	0.092
04239+0928	Hu 304	27820	91.8990	209.8	0.047
04275+1113	Bu 1186	28217	91.8990	108.1	0.148
04298+1741	Cou 567	28436	91.9021	15.5	0.126
04357+1010	CHARA 18 Aa	29140	91.8967	330.5	0.212
04361+0813	A 1840 AB	29196	91.9020	86.4	0.150
04366+1945	STT 86	29193	91.9022	10.7	0.473
04378+3116	Cou 883	282310	91.9022	51.2	0.265
04387+1011	A 2035	286952	91.9020	113.0	0.229

TABLE 2. (continued)

WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (°)	ρ (″)	WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (°)	ρ (″)
04398+1632	Bu 1044	29562	91.9021	210.3	0.650	05406+1506	Hei 109	246207	91.9050	63.1	0.224
04399+5329	Bu 1295 AB	29316	91.8967	185.4	0.167	05411+1632	Bu 1007	37711	91.9050	241.1	0.316
			93.2021	176.5	0.208	05421+2135	A 2110 AB	37801	91.9050	123.7	0.454
04400+2301	Hu 442	29538	91.9022	76.8	0.104	05436+6633	Hu 1109 AB	37419	91.9049	140.8	0.140
04404+1631	CHARA 154	29608	93.2045	30.5	0.654 *	05439+2937	Cou 895	246742	91.9049	55.0	0.158
04416+1643	A 2353	29727	91.9022	158.8	0.122	05445+1503	STT 115 AB	38182	91.9050	119.5	0.451
04422+2257	McA 16	29763	91.8969	112.9	0.196	05449+2620	A 496	38161	91.9050	6.6	0.281
			93.2021	102.7	0.204	05450+2812	Cou 762	38153	91.9049	59.4	0.182
04432+5932	A 1013	29606	91.8969	268.3	0.207	05472+2153	Hu 39	38493	91.9050	42.9	0.296
04529+3548	Hu 819	30884	91.8939	280.5	0.417	05474−1032	McA 22	38735	93.2050	299.6:	0.166:
04536+2522	CHARA 127 Aa	31033	91.9022	135.8	0.148	05491+6248	STF 3115	38284	91.8940	348.1	0.858
04573+5345	D 5	31278	91.8939	220.9	0.504	06017+2224	CHARA 161	40724	93.1967	188.2:	0.090:
04599+5328	A 1303	31578	91.8939	301.8	0.184	06041+2316	Kui 23 AB	41116	91.9025	217.0	0.154
05017+2640	A 1844	32092	91.8939	58.6	0.310	06053+7400	STT 121	40225	91.8940	227.9	0.287
05030+1931	A 2428 AB	285215	91.9048	278.9	0.169	06154−0902	A 668	43362	93.2050	285.5:	0.115:
05044+2139	Cou 154 AB	32481	91.9048	307.3	0.243	06159+0110	RST 5225	43358	91.8969	301.4	0.128
05044+2938	A 1024	32429	91.9048	336.7	0.751	06160+2347	Cou 578	43206	91.8997	36.1	0.337
05044+6237	Hu 1094	32001	91.9049	172.9	0.068	06171+0957	Fin 331 Aa	43525	91.8969	147.2	0.072
05046+7404	STT 89	31590	91.8939	299.2	0.436	06200+2826	Bu 895 AB	43885	91.8997	138.1	0.266
05048+1319	Hei 104	32595	91.9048	2.7	0.199	06212+2932	CHARA 165	44092	93.1967	215.3:	0.210:
05049+3054	Cou 888 Aa	282854	91.9048	306.1	0.328	06216+2500	Cou 718	44211	91.8997	140.4	0.200
05054+4655	A 1023	32416	91.8940	60.4	0.314	06255+2327	CHARA 23	44926	93.2024	150.8	0.130
05055+1948	STT 95	32642	91.9048	302.0	0.937	06256+2320	McA 26	44927	91.8995	148.8	0.082
05056+2304	STT 97	32641	91.9048	151.4	0.364	06283+2441	Cou 914	45428	91.8997	119.2	0.215
05058+0811	A 1945	32753	91.9048	47.6	0.244	06289+2014	BTZ Aa	45542	91.8969	309.8	0.053
05070+3004	A 1028	32810	91.9048	225.4	0.455	06357+2816	A 506	46610	91.8997	34.5	0.243
05072+2224	Cou 155	32864	91.9048	328.5	0.249	06367+2139	A 2119	46882	91.8995	263.0	0.357
05077+1413	Hu 1222	32979	91.9048	96.0	0.148	06383+2859	McA 27	47152	91.8969	129.7	0.216
05079+0830	STT 98	33054	91.8940	343.1	0.679				93.2024	128.1	0.224
05079+5459	STF 635	32652	91.8940	301.1	0.951	06393+4200	STT 150	47193	91.8942	202.9	0.134
05085+3755	Cou 1531	32949	91.8940	75.3	0.292	06404+4058	STF 945	47412	91.8942	316.7	0.485
05089+0313	A 2636	33236	91.9047	161.2	0.298	06418+3041	A 218	47812	91.8997	60.6	0.219
05099+3617	Cou 1533	33153	91.9048	255.7	0.185	06452+2913	Cou 1240	262951	91.8997	85.7	0.487
05108+3622	Cou 1719	280596	91.9048	103.8	0.179	06455+2922	A 122	48591	91.8997	42.5	0.335
05126+2616	A 210	33622	91.9048	77.9	0.064	06462+4203	A 2457	48588	91.8942	2.5	0.224
05129+4136	A 1554	33543	91.9049	356.7	0.211	06474+1812	STT 156	49059	92.3121	223.8	0.357
05130+0828	A 2701	33777	91.9048	6.9	0.479	06502+3625	Cou 1738	49472	91.9052	130.4	0.106
05133+2959	Cou 710	33706	91.9048	8.8	0.270				93.2050	134.2	0.109
05134+0158	STT 517 AB	33883-4	91.9047	236.3	0.572	06503+2410	Cou 768	49622	91.9052	207.8	0.157
05140+3655	Pop 140	33749	91.9048	161.3	0.277				93.2050	200.0	0.164
05142+3158	Cou 711	33800	91.9048	96.4	0.158	06532+5928	STF 963 AB	49618-9	91.8969	280.9	0.233
05181+0342	A 2639	34501	91.9047	285.5	0.817				93.2024	283.9	0.226
05195+3809	Cou 1870	34493	91.9049	21.0	0.470	06532+3827	Cou 1877	50037	92.3121	165.8	0.434
05219+3934	Cou 2037	34807	91.8940	142.2	0.366	06580+0218	CHARA 25	51566	91.8970	37.8	0.921
05240+3238	Cou 1090	35132	91.9048	230.3	0.243	06584+2443	Cou 921	267067	91.8997	52.4	0.197
05256+4424	A 1306	35252	91.9049	227.2	0.069	07011+1146	STT 163 AB	52309	91.8970	80.4	0.134
05269+3017	A 1033 AB	35557	91.9049	144.8	0.394				92.3123	82.5	0.148
05270+2737	Ho 226 AB	35586	91.9050	263.2	0.748	07036+3941	A 1959	+39 1828	91.9052	356.1	0.256
05271+1758	McA 19 Aa	35671	82.7551		<0.036 *	07043+3734	McA 29	52823	91.3237	180.6	0.187
			82.7607		<0.036				91.8969	181.6	0.194
			83.0474		<0.036				92.3121	183.9	0.195
			83.7108		<0.036				93.2024	180.4:	0.195:
			86.8893	101.9	0.065	07168+0059	A 2855	56361	91.8970	258.8	0.401
			87.2717	100.0	0.075	07171−1201	A 2123 AB	56593	91.8970	157.7:	0.362:
			88.2518	96.7	0.083	07173+3744	Cou 1883	+37 1696	91.8998	59.8	0.659
			88.6609	95.3	0.088	07190+3804	Cou 2069	+38 1732	91.8998	118.7	0.379
			89.2374	97.4	0.093	07205+0024	STF 1074 AB	57275	91.8970	170.2	0.669
			90.2698	91.7	0.101	07277+2127	McA 30 Aa	58728	93.2025	341.4:	0.105:
			90.7554	86.6	0.104	07305+0743	A 2869	59473	93.2050	330.2	0.070
			91.9023	85.5	0.113	07309+3034	A 673 AB	59372	91.8997	351.9	0.388
05290−0318	Da 6	36058	91.9023	225.4	0.140	07325+3543	Pop 105	+36 1643	91.8998	48.0	0.752
05297+3523	Hu 217	35921	91.9049	253.1	0.612	07336+1550	McA 32	60107	91.3237	285.5	0.116
05310+2635	Cou 574	36174	91.9050	143.3	0.333	07352+3058	STT 175 AB	60318	91.8943	327.7	0.198
05311+4255	A 1721	36053	91.9049	112.2	0.205				92.3068	327.8	0.191
05349+3100	Cou 1092	244913	91.9049	274.4	0.207				93.1967	327.3	0.187
05350+1838	A 2354	36796	91.9050	312.6	0.498	07401+0515	STF 1126 AB	61563	91.8970	167.7	0.942
05372+2656	STF 749 AB	37098	91.9050	325.3	1.137	07417+3726	STT 177	61600	91.8998	159.9	0.446
05373+6642	MLR 314	36496	91.9049	178.1	0.183 *				92.3123	159.4:	0.445:
			93.2023	182.4	0.186	07431+0012	A 2534 AB,C	62264	91.8970	231.4:	0.838:
05373+4339	A 1562	36928	91.9049	351.2	0.399	07462+2108	Ho 247	62720	91.9025	238.8	0.422
05386+3030	Bu 1240 AB	37269	93.2023	357.6	0.153	07471+1847	Cou 772	62947	91.9025	71.9	0.266
05387−0235	Bu 1032 AB	37468	91.9023	131.1	0.253	07479+6019	Hu 1247	62522	92.3124	56.7:	0.141:
			93.2050	127.8:	0.253:				93.2025	51.0:	0.171:
05394+4343	A 1564	37265	91.9049	143.4	0.174	07484+5310	A 1330	233452	91.9026	117.3	0.498
05398+3758	STT 112	37384	91.9049	51.3	0.859	07486+2309	WRH 15 AB	63208	91.9025	44.3	0.280
05400+3601	Hu 825	37405	91.9049	345.9	0.391	07506+1944	Cou 926	+20 1920	91.9025	254.4	0.283

TABLE 2. (continued)

WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (°)	ρ (″)
07518−1352	Bu 101	64096	91.9052	294.7	0.555
			93.1968	297.2	0.528
07546+3100	A 675	64326	91.9026	166.1	0.172
07556+5831	A 1072	64123	91.9026	352.9:	0.191:
07561+2342	Cou 929	64704	92.3068	176.8	0.194
			93.1967	180.0	0.191
07573+0108	STT 185	65123	91.9052	130.8	0.133
			93.1968	135.1	0.138
08001+2659	Cou 1112	+27 1521	91.9025	95.0	0.279
08017−0836	A 1580	66094	91.9052	272.2	0.250
08017+6019	McA 33	65339	91.3265	303.8	0.086 *
			91.8943	306.7	0.085
			92.3124	310.7	0.080
08033+2616	STT 186	66176	91.3210	74.2	0.972
			91.9025	74.0	0.973
08043+3302	STT 187	66299	91.3210	350.6	0.374
			91.9026	350.2	0.378
08047+4717	A 2050 AB	66263	91.3265	50.3	0.076
			91.9026	57.8	0.076
08050+5825	A 1073	66045	91.3265	158.6	0.259
			91.9026	158.9:	0.255:
08070+5407	A 1333	66610	91.3210	206.8	0.392
			91.9026	206.7	0.390
08095+3213	CHARA 190 Aa	67501	91.3210	147.7	0.148 *
			91.9026	148.0	0.151
08122+1739	STF 1196 AB	68255-7	91.3239	159.8	0.601
			91.8943	153.5	0.612
			92.3124	148.8	0.616
			93.1968	139.0	0.640
08126+2849	Cou 1114	68254	91.9026	224.3	0.191
			93.1967	224.3:	0.193:
08148+3630	Hu 1123	68660	91.3210	155.9	0.416
			91.9026	157.4	0.417
08155+2124	Cou 279	+21 1798	91.9025	126.1	0.083
08193+4052	A 2362	69580	91.3210	172.7	0.585
			91.9026	172.1	0.591
08199+0357	Fin 346	70013	91.3239	67.3	0.270
			93.1968	66.6	0.264
08214−0136	STF 1216	70340	91.3239	285.4:	0.526:
08231+2001	Ho 525 AB	70492	91.9025	143.6	0.336
08244+6453	Hu 853	70166	91.3265	0.7	0.257
08248+2149	Cou 281	+22 1926	91.3265	121.1	0.379
			91.9025	120.5	0.372
08253+3723	Hu 856	70803	91.9026	270.3	0.253
08267+2433	A 1746 BC	71153	91.3265	82.1	0.146
			92.3068	95.7	0.150
			93.1967	109.1:	0.145:
08278−0425	A 550	71499	91.9052	170.9	0.159
08285−0230	A 551 AB	71663	93.1968	219.0:	0.079:
08315−1934	I 489	72310	91.9052	333.2	0.231
			93.1969	329.5:	0.239:
08326+3227	Hu 717	72170	91.3265	55.0	0.526
			91.9026	54.3	0.526
08402+1921	CHARA 130	73712	93.1968	342.1	0.071
08412+4352	A 1749	+44 1776	91.3210	108.3	0.624
08439+4403	A 1752	74133	91.3267	243.4	0.273
			91.8999	252.6	0.316
08468+0625	SP AB	74874	92.3068	110.8	0.161
			93.2026	131.2:	0.212:
08476+0005	RST 5306	75012	91.3184	34.0	0.152
08486+0057	A 2552	75207	91.3184	97.3	0.169
			92.3068	92.8	0.179
08507+1800	A 2473	75470	91.3184	54.2	0.311
			91.8944	54.9	0.307
08514+2105	Cou 588	75557	91.3184	335.7	0.418
			91.8944	335.5:	0.424:
08531+5458	A 1584	75553	91.3267	46.9	0.314
			91.8944	47.5	0.339
			92.3068	50.3	0.351
08537+2909	Cou 1251	+29 1838	91.3184	180.9	0.657
			91.8999	181.4	0.658
08539+1958	Cou 773	75974	91.3184	45.2	0.224
			91.3293	45.6	0.218
			91.8944	46.0	0.217
			92.3068	46.0	0.216
			93.2051	46.2	0.213
08539+0149	A 2554	76050	91.3184	336.4	0.274
08542+3034	STF 1291 AB	75959	91.3184	312.7	1.500
			91.3210	312.5	1.504
08549+2613	A 2131 AB	76095	91.3184	217.4	0.394
			91.8944	219.7	0.395
			92.3068	221.1	0.393
08557+7048	STF 1280 AB	75632	91.3267	172.5	0.879
08557+4141	A 2132	76117	91.8999	206.6	0.198
			92.3068	206.9	0.194
			93.2051	207.0	0.196
08585+3548	Cou 1897	76595	91.3268	181.4	0.157
			91.8999	184.0	0.157
			92.3068	184.4	0.154
			93.2051	186.5	0.153
08587+2523	A 1974	76720	91.8999	203.1	0.210
			93.2051	201.3	0.206
08588+1414	Hu 861	76793	91.3210	25.6	0.252
			93.2052	24.5:	0.239:
09008+4148	Kui 37 AB	76943	91.3210	217.8	0.553
			91.8944	209.4	0.564
			92.3068	203.5	0.559
			93.2025	190.1	0.527
09036+4709	A 1585	77327	91.3295	260.8	0.119
			91.8944	256.4	0.100
			92.3068	251.8	0.087
09067+5038	Hu 722	77801	91.3212	233.6	0.517
			91.8944	232.1	0.513
09123+1459	Fin 347 Aa	79096	91.3267	192.5	0.075
			91.8943	150.0	0.154
			92.3068	137.4	0.163
09124+2652	A 1977	+27 1722	91.8999	137.3	0.153
09154+2346	A 1979	79531	91.3267	190.1:	0.192:
			91.9000	194.2:	0.199:
09180+2835	STF 3121	79969	91.3210	293.5	0.209
			91.8944	311.9	0.206
			92.3068	321.8	0.222
09185+3522	STF 1333	80024	91.3210	48.3	1.894
09210+3812	STF 1338 AB	80441	91.3210	271.9	1.032
			91.8999	273.0	1.028
09229−0951	A 1342 AB	81009	92.3068	47.4	0.123
09245+0621	STF 1348	81212	91.3210	315.5	1.975
09245+1808	A 2477	81163	91.3210	340.8	0.411
			91.8944	341.5	0.412
09278−0604	B 2530	81809	92.3068	328.5	0.507
09279+3128	Ho 366 AB	81656	91.8999	95.8	0.141
			93.2051	102.5	0.129
09285+0904	STF 1356	81858	91.3210	58.8	0.471
			93.2026	64.8	0.481
09299+5808	MLR 549	81772	91.3295	124.3	0.235
09326+0151	Fin 349	82543	91.3267	193.7	0.141
			91.9052	197.4	0.140
			92.3068	199.1	0.138
			93.2026	204.6:	0.136:
09371+1614	STF 1372	83190	92.3069	208.2	0.063
			93.2052	218.0	0.083
09379+4554	A 1765	83158	91.3295	129.3	0.122
			91.9027	126.8	0.111
			92.3070	123.5	0.106
			93.2051	112.5	0.102
09388+3017	Cou 1254	+30 1886	91.9000	85.3	0.530
			92.3069	85.1	0.519
09415+1753	A 2481	83840	91.3267	357.0:	0.351:
			91.9027	355.4	0.355
			92.3069	357.4	0.354
09429+5035	Hu 629	83887	91.3212	20.4	0.352
			91.9027	18.6	0.363
			92.3070	18.0	0.358
09452+4109	Cou 2085 Aa	+41 2002	91.9027	31.0	0.142
			93.2051	30.2	0.143
09474+1134	McA 34	84722	91.3267	1.3	0.057
			91.9052	8.7	0.080
			92.3068	12.5	0.094
			92.3125	9.7	0.091
			93.2026	14.4	0.123

TABLE 2. (continued)

WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (°)	ρ (″)
09477+2036	Cou 284	84739	91.3186	54.3	0.134
			91.9027	52.5	0.130
			92.3069	51.8	0.128
			93.2051	51.3	0.126
09498+2111	Kui 44	85040	91.3185	206.9	0.169
			91.8945	206.9	0.162
			92.3069	205.8	0.155
			93.2026	202.4	0.137
09512+3629	Ho 369 AB	85177	91.3185	102.0	0.400
			91.9027	102.2	0.398
			92.3069	102.4	0.400
09521+5404	STT 208	85235	91.3240	200.2	0.186
			91.8945	205.2	0.190
			92.3070	207.9	0.192
			93.2025	216.5	0.196
09525−0806	AC 5 AB	85558	91.3295	71.1	0.564
09544+3041	Cou 1258	85708	91.3185	55.0	0.145
			91.9000	55.7	0.142
			92.3069	54.4	0.138
			93.2051	55.4	0.129
09566+4359	Pop 151	85973	91.3184	80.5	0.503
			91.9027	80.6	0.503
			92.3070	80.4	0.501
09577+2540	Cou 938	+26 2029	91.9000	41.5	0.230
			92.3069	40.4	0.214
			93.2051	40.7	0.225
09581+3856	Cou 2086	86237	91.3185	68.9	0.187
			91.9027	68.7	0.188
			92.3069	67.8	0.184
			93.2051	69.6	0.183
10000+2433	CHARA 145	86590	91.3185	33.2	0.249
			91.9000	31.6	0.257
			92.3069	31.0	0.262
			93.2051	28.8	0.283
10073+1646	WRH 18	87737	91.3186	341.9	0.053
10083+3137	Kui 48 AB	87822	91.8945	157.1	0.053
			92.3069	159.4	0.072
			93.2025	164.8	0.119
10093+2020	A 2145	88021-2	91.9027	27.4	0.037
10117+1321	Hu 874	88355	91.3212	281.7	0.174
			91.9052	283.6	0.183
			92.3068	283.6	0.191
			93.1969	283.6	0.203
10121−0613	Ho 44	88478	91.3295	205.0	0.575
10260+0256	A 2570	90361	91.3212	305.6	0.317
10269+1931	Cou 292	90460	91.3186	225.9	0.223
			93.2053	217.6	0.218
10270+1713	STT 217	90444	91.3186	145.1	0.599
			91.9027	145.3	0.602
			92.3097	144.5	0.606
10279+3643	Hu 879	90537	91.3185	242.7	0.202
			91.8973	245.3	0.178
			92.3096	247.5	0.161
			93.1970	254.6	0.122
10287+4558	A 1993	90619	91.3240	142.9	0.336
			91.9053	144.8	0.331
			92.3125	145.2:	0.325:
10290+3452	A 2152	90698	91.3185	44.5	0.414
			92.3125	44.3	0.410
10366+4430	A 2055 AB	91751	91.3184	165.8	0.337
			91.9054	167.1	0.342
10376+3446	Cou 1417	91949	91.3185	205.6	0.301
			93.2053	201.7:	0.288:
10427+0335	A 2768	92749	91.3212	285.5	0.365
			91.9053	285.3	0.370
			92.3097	284.0	0.381
			92.3126	284.1	0.379
			93.1969	280.2	0.396
10432+0440	A 2769	92812	92.3126	213.9	0.523
10453+3831	Ho 532 AB	+39 2376	83.4277	279.6	0.775 *
			84.3860	271.1	0.700
			91.3185	264.2	0.677
10453+3831	CHARA 191 Aa	+39 2376	83.4277	132.8	0.381 *
			84.3860	139.5:	0.383:
			91.3185	134.7	0.360
10472+2605	Cou 591	+26 2131	91.3185	3.9	0.417
10473+2235	STT 228	93392	91.3185	172.6	0.64
			92.3125	172.5	0.64
10481+4107	STT 229	93457	91.3185	274.9	0.75
			91.9054	274.9	0.74
10520+1606	A 2373	94120	91.3213	77.3	0.12
			91.9052	73.3	0.12
			92.3126	72.5	0.12
			93.2053	70.9:	0.13
10544+3840	Cou 1746	+39 2389	91.3213	304.4	0.38
10585+1711	A 2375	95037	91.3268	198.1	0.38
11008+2913	Cou 960	95342	91.3268	105.1	0.19
11037+6145	Bu 1077	95689	91.3241	269.0	0.67
11050+3825	Ho 378	96016	91.3295	56.0	0.99
11053+1635	A 2378	96130	91.3295	138.7	0.50
11100+1443	Hei 60	96953	91.3213	257.8	0.36
11136+5525	A 1353	97455	91.3241	221.3	0.50
			91.9053	220.6	0.50
			92.3125	220.8	0.50
11137+2008	STF 1517	97561	91.3268	323.5	0.50
			92.3125	323.4	0.50
11150+3735	STT 232	97731	87.2666	58.9	0.63
			88.2578	58.5	0.62
			91.3295	58.4	0.61
			92.3096	58.2:	0.61
11150+3735	CHARA 192 Aa	97731	87.2666	16.7	0.09
			88.2578	15.7	0.08
			91.3295	0.4	0.07
11154+4728	Hu 639	97773	91.9053	87.4	0.14
			93.1970	87.1	0.15
11158+4227	Cou 1904	97857	91.3268	202.0	0.38
			91.9054	202.1	0.39
11174+4146	A 2158	98087	91.3295	359.6	0.45
			91.9054	0.2	0.45
11182+3132	STF 1523 AB	98230-1	83.0673	98.2	2.65
			84.3724	91.9	2.37
			85.0029	91.6	2.33
			91.3268	37.0	1.00
			91.9000	24.4	0.92
			91.9052	24.0	0.92
			93.1969	352.8	0.89
11191+3811	CHARA 133	98353	93.1970	248.2	0.04
11221+3705	Cou 1260 BC	98745	91.3213	15.5	0.33
			91.3268	15.3	0.32
			93.2053	14.7	0.33
11279−0142	RST 4944	99651	91.3268	283.2	0.22
			92.3070	283.2	0.21
			93.2052	281.4	0.21
11308+4117	STT 234	100018	91.3295	146.3	0.42
			91.9053	148.0	0.43
			92.3071	148.3	0.43
			93.1970	149.6	0.44
11322+3615	Hu 1134	100235	91.3213	121.4	0.14
			92.3071	121.5	0.15
			93.1970	121.4	0.15
11324+6105	STT 235	100203	91.3241	294.3	0.58
			91.9053	298.6	0.58
			92.3098	300.1	0.57
			93.1970	305.9	0.59
11336+4729	Cou 1573	+48 1954	91.3268	91.2	0.59
11350+3348	A 2159	+34 2233	93.2053	276.7	0.15
11363+2747	STF 1555 AB	100808	91.3268	145.2	0.65
			92.3071	145.6	0.66
11379+4949	Hu 728	101024	91.3213	117.2:	0.38
			92.3098	115.4	0.37
11415+3145	62 UMa	101606	93.1969	232.4	0.04
11425+2354	Cou 390	101728	91.3268	189.9	0.57
11441−0448	RST 5524	101969	93.2052	107.9	0.09
11499+3754	Cou 1129	+38 2283	91.3295	142.7	0.56
			92.3071	141.3	0.56
11520+4806	Hu 731	+48 1978	91.3241	312.2	0.89
11551+4629	A 1777 AB	103483	91.3213	223.4	0.10
			91.3269	221.7	0.10
			91.9053	227.8	0.08
			92.3071	231.6	0.09
			93.1970	241.9	0.09

TABLE 2. (continued)

WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (°)	ρ (″)
12005+6912	A 1088	104288	91.3241	309.6	0.118
			93.1970	319.6	0.119
12010+4347	A 1779	104334	91.3241	27.8	0.591
			92.3071	27.0:	0.588:
12061+6842	STF 3123 AB	105122	91.3241	267.1	0.198
			91.9053	265.5	0.201
			93.1970	260.8:	0.204:
12080+4242	A 1998	105369	91.3241	355.0	0.378
			92.3071	353.1	0.384
12108+3954	STF 1606	105824	91.3213	218.8	0.279
			92.3071	212.3	0.276
			93.1970	206.8	0.282
12160+4807	Hu 736	106689	91.3213	212.9	0.271
			92.3073	206.8:	0.277:
12199−0040	McA 37	107259	91.3186	200.6	0.108
			92.3098	233.5	0.094
12238+5410	STT 249 AB	107922	92.3098	262.4:	0.396:
12244+4306	STT 250	108005	91.3241	345.7	0.375
			92.3098	346.7	0.373
12267−0535	A 78	108320	91.3186	181.5	0.108
			92.3127	183.1	0.085
			93.1973	197.2:	0.075:
12348+2238	WRH	109485	91.3213	1.5	0.209
			92.3098	359.7	0.182
			93.1971	356.7	0.152
12349−0509	RST 4502	109452	91.3186	202.2	0.110
			92.3127	208.1	0.101
			93.1973	215.1:	0.095:
12409+2708	Cou 596	110297	91.3269	220.7	0.087
			92.3098	218.0	0.096
			92.3127	217.9	0.100
			93.1971	214.6	0.113
12422+2622	A 1851	110465	91.3242	276.9	0.516
			92.3127	280.3	0.506
			93.2054	282.0	0.518
12533+2114	STF 1687 AB	112033	91.3242	176.1	1.043
12533+4246	Cou 1579	+43 2270	92.3126	46.9	0.204
12564−0057	STT 256	112398	91.3186	96.8	1.002
			92.3098	96.9	0.998
12572+0818	Fin 380	112503	91.3186	156.9	0.194
			92.3098	157.9	0.203
			92.3127	157.4	0.202
			93.1973	157.3	0.210
12575+2457	Cou 397	112572	91.3187	63.5	0.634
			92.3098	63.5	0.641
12597−0348	CHARA 39 Aa	112846	91.3186	3.1	0.103
			91.3269	3.8	0.100
			93.1973	47.5:	0.098:
13029+1328	STF 1711	113322	91.3187	338.8	0.496
			92.3098	339.0	0.496
			92.3127	338.1:	0.490:
13039−0340	Bu 929	113459	91.3186	199.0	0.677
			92.3127	199.0	0.675
13069+5200	A 1605	234012	91.3187	167.1	1.015
13100−0532	McA 38 Aa	114330	91.3186	332.7	0.468
			92.3127	332.8	0.462
			93.1973	333.4:	0.452:
13100+1731	STF 1728 AB	114378-9	91.3187	12.0	0.457
			91.3269	12.2	0.458
			92.3098	12.0	0.513
			92.3127	12.1	0.513
			93.1973	11.9	0.514
13134+5252	A 1607	115002	91.3187	19.1	0.479
			92.3126	19.5	0.476
13175−0041	Fin 350	115488	91.3186	331.0	0.058 *
			92.3098	352.8	0.085
			93.1973	1.6	0.114
13197+4747	Hu 644	115953	91.3187	261.8	0.788
			92.3126	257.5	0.604
			93.2054	255.1	0.489
13197+4747	CHARA 193 Aa	115953	92.3126	103.7	0.109 *
13202+1747	A 2166	115955	91.3187	0.7	0.140
			92.3098	4.3	0.138
			92.3127	4.2	0.139
			93.1971	7.7	0.127
13207+0257	STF 1734	115995	91.3242	176.9	1.133
13225+4242	Cou 1581	116377	91.3187	159.3	0.280
			92.3126	160.1	0.288
13236+2914	Ho 260 AB	116495	91.3242	77.7	1.306
13253+7559	STT 267	117173	91.3187	25.0	0.113
13258+4430	A 1609 AB	116878	91.3187	332.3	0.338
			92.3101	337.9	0.357
			92.3129	337.7	0.359
13266+3235	Cou 787	+33 2337	91.3187	150.0	0.345
			92.3099	149.1	0.345
13320+3109	Wor 24	+31 2500	90.2704	255.1:	0.277:
			91.3270	239.3:	0.337:
13328+3454	STT 269 AB	117902	91.3187	17.3	0.089
			91.3214	21.1	0.089
			91.3270	18.9	0.089
			92.3099	23.2	0.111
			92.3129	22.8	0.112
			93.1971	26.4	0.131
13343+3044	Cou 600	+31 2508	91.3187	56.0	0.551
			92.3099	55.9	0.547
13396+1044	Bu 612 AB	118889	91.3187	240.0	0.237
			92.3099	247.7	0.206
			93.1973	256.4	0.175
13400+3759	Hu 897	+38 2467	91.3187	34.9	0.386
			92.3101	35.6	0.386
13461+0507	STF 1781	119931	91.3186	162.3	0.565
			92.3099	164.9	0.592
			93.1973	166.8	0.609
13472−0943	Kui 65	120033	92.3127	234.4	0.273
			93.1974	234.8:	0.262:
13576+5200	A 1614	121995	92.3129	128.6	1.342
14020+5713	A 1097 AB	122740	92.3101	234.1	0.426
14029+1417	Hei 65	122654	92.3099	116.6	0.455
14037+0829	Bu 1270	122769	91.3190	188.1	0.100
			91.3270	189.9	0.101
			92.3099	214.1	0.109
			92.3127	214.5	0.110
			93.1973	234.2	0.123
14082+3645	STT 276 AB	123670	91.3188	205.7	0.484
			91.3217	205.3	0.483
			92.3099	205.5	0.484
14113+3013	Cou 605	+30 2488	92.3099	169.9	0.311
14120+4411	STT 278	124399	91.3188	303.6	0.331
			92.3101	302.4	0.332
14124+2843	STT 277 AB	124346	91.3188	46.0	0.280
			92.3099	46.6	0.274
			93.1971	47.5	0.272
14138+0859	A 1100	124492	91.3190	172.5	0.293
			92.3099	172.2	0.297
			93.1973	172.2	0.288
14138+3100	Cou 606	+31 2596	91.3188	98.7	0.186
			92.3099	89.1	0.200
14139+2906	STF 1816	124587	91.3188	89.8	0.675
			92.3099	90.2	0.662
14153+0308	STF 1819	124757	91.3217	217.4	0.871
			92.3099	214.9	0.884
14175+1722	A 2067	+18 2859	91.3297	251.5	0.098
			92.3099	254.6	0.097
14180+6914	A 1102	125725	92.3101	96.5	0.411
14213+3050	Cou 482	+31 2612	91.3188	120.0	0.620
			92.3073	120.2	0.624
14220+5107	A 148	126126	91.3187	5.1	0.624
			92.3073	5.1	0.625
14234+0827	Bu 1111 BC	126128	91.3190	87.9	0.193
			92.3074	99.1	0.173
14241+1617	McA 39	126269-0	91.3270	150.6	0.058
			92.3074	157.4:	0.054
			93.1975	149.9	0.047
14268+1625	A 2069	126695	91.3188	237.0	0.255
			92.3074	235.3	0.255
			93.1975	233.0	0.259
14303+4709	Cou 1917	+47 2153	91.3188	29.2	0.336
14304+2255	Cou 97	+21 2659	91.3188	243.5	0.335
			92.3074	243.9	0.345
14323+2641	A 570	127726	92.3073	204.6	0.215
			93.1975	196.5	0.222

TABLE 2. (continued)

WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (°)	ρ (″)
14339+2949	AGC 6	128042	91.3188	134.7	0.782
			92.3073	134.7	0.788
14340+4113	Cou 1437	+41 2512	91.3188	34.6	0.157
			92.3073	31.4	0.160
14358+0015	Bu 941 AB	128233	91.3243	144.1	0.238
14367+2014	Cou 98	+20 2993	91.3188	198.2	0.293
14369+4813	A 347	128718	91.3188	262.9	0.574
			92.3073	261.8	0.573
14373+0217	CHARA 42 Aa	128563	91.3243	3.9	0.115
			91.3270	7.3	0.111
			93.1974	35.1:	0.069:
14381+5135	STF 1863	128941	91.3187	65.6	0.652
			91.3217	65.9	0.650
			92.3073	65.1	0.651
14401+0504	A 1107	129006	91.3217	90.5	0.447
14403+2158	McA 40	129132	92.3074	255.1	0.074
			93.1975	245.9	0.063
14411+1344	STF 1865 AB	129246-7	91.3190	302.1	0.905
			92.3074	302.2	0.892
14416+2747	Cou 407	129411	92.3073	119.5	0.392
14426+1930	Hu 575 AB		92.3074	237.6	0.356
14455+4222	STT 285	130188	91.3218	303.7	0.382
			92.3073	301.6	0.390
			93.1976	299.2	0.398
14459+2343	Cou 100	+24 2770	91.3297	280.3	0.145
			93.1975	263.9	0.147
14489+0557	STF 1883	130604	91.3190	285.8	0.650
			92.3074	285.0	0.673
			93.1974	284.6	0.690
14492−1050	Hu 141	130558	91.3190	117.9	0.328
14493+1014	A 2983	130669	91.3190	286.8	0.142
			91.3297	283.4	0.148
			92.3074	296.2	0.173
			93.1974	307.1	0.182
14497+0800	A 1110 AB	130726	91.3190	246.1	0.648
			92.3074	245.8	0.647
14534+1543	STT 288	131473	91.3217	169.1	1.311
14548+2411	Cou 409 Aa	+24 2795	92.3074	215.6	0.510
14565+0255	A 2172	131954	91.3190	169.2	0.105
			91.3297	164.6	0.097
			92.3074	162.5	0.100
			93.1974	159.0	0.106
14588+3551	Cou 1136	132583	91.3297	118.4	0.151
			92.3073	114.2	0.152
14590+0059	A 2173	+01 3009	91.3190	128.6	0.278
14593+4649	Cou 1760	+47 2190	92.3073	216.6:	0.219:
14595+1753	Cou 188	+18 2966	91.3190	226.3	0.293
			92.3074	224.8	0.290
15018+0008	Bu 348 AB	132933	91.3190	109.1	0.505
			92.3074	109.2	0.502
15039+4739	STF 1909	133640	91.3218	48.7	1.702
15078+3956	Cou 1271	134303	91.3218	173.7	0.375
15088+4013	Cou 1272	+40 2859	91.3218	43.6	0.293
15089−0610	RST 4534 AB	134213	91.3190	11.2	0.380
			92.3075	12.1	0.399
15116+1008	A 1116	134827	91.3190	47.6	0.778
			92.3075	47.4	0.778
15121+1858	Cou 189	134943	91.3218	143.8	0.458
			92.3075	143.2	0.468
			93.1975	142.9	0.470
15123−1947	B 2351 Aa	134759	93.1974	216.9:	0.105:
15136+3453	Ho 60	135365	91.3297	148.2	0.076
			92.3101	145.6	0.076
15183+2649	STF 1932 AB	136176	91.3218	255.6	1.534
15192+4329	A 1630	+44 2449	92.3102	245.6	0.789
15200+2338	Cou 103	+24 2847	92.3101	282.6	0.548
15210+2104	Hu 146	136596	91.3218	128.7	0.647
			92.3101	128.1	0.659
15232+3018	STF 1937 AB	137107-8	91.3218	29.9	1.034
			92.3101	32.8	1.038
			93.1975	35.4	1.026
15233+4022	Cou 1441	+40 2878	91.3218	14.5	0.254
15245+3723	CHARA 181 Aa	137391	93.1976	279.8	0.107 *
15246+5413	Hu 149	137588	91.3218	272.8	0.622
			92.3102	272.6	0.622
15259+6032	MLR 346	+61 1505	91.3271	36.0:	0.270:
15268+2840	Cou 484	137739	92.3101	72.0	0.300
15272+1804	A 2073	137740	92.3075	112.4:	0.284
15272+4133	Cou 1443	137896	91.3218	178.3	0.488
15273+1738	A 2074	137792	91.3298	237.7	0.145
			92.3075	242.1	0.160
			93.1975	243.4	0.173
15278+2906	β CrB	137909	91.3219	310.2	0.084
			92.3101	196.5	0.082
			93.1975	168.5	0.174
15282+0251	A 2175	137844	91.3273	196.7	0.276
			93.1974	196.2	0.272
15307+3810	Hu 1163	138439	91.3271	82.8	0.113
			92.3102	99.1	0.116
			93.1976	102.3	0.119
15318+4053	A 1634 AB	138629	92.3102	226.0	0.048
			93.1976	199.1	0.060
15329+3121	Cou 610	138749	91.3219	200.9	0.755
			92.3101	200.5	0.762
15333+4149	STF 1956	138884	91.3218	32.3	0.285
			92.3102	31.3	0.268
15347+2655	Cou 798	+27 2513	91.3298	79.8	0.101
15361+3948	STT 298 AB	139341	91.3218	157.2	0.325
			92.3102	169.9	0.350
			93.1976	180.4	0.340
15370+6426	Hu 1168	139905	91.3270	147.9	0.229
15382+3614	STF 1964 CD	139691	91.3219	19.0	1.591
15390+2545	Cou 612	139749	91.3219	229.1	0.242
			92.3101	226.7	0.224
			93.1975	223.3	0.231
15405+1841	A 2076	139939	91.3273	181.6	0.689
			92.3075	181.7	0.695
15406+3128	Cou 613	140065	91.3219	346.8	0.248
			92.3101	345.5	0.252
15413+5959	STF 1969	140590	91.3271	23.8	0.704
15416+1941	Hu 580 AB	140159	91.3219	250.9	0.212
			91.3298	250.8	0.212
			92.3101	252.6	0.199
			93.1975	254.2	0.176
15420+0028	A 2176	140122	91.3273	295.2	0.102
			91.3298	298.0	0.103
			92.3075	307.6	0.111
			93.1974	315.6	0.122
15420+4204	Cou 1445	140432	91.3271	228.7	0.064
15424+6113	MLR 48	140811	91.3271	102.8	0.300
15428+2618	STF 1967	140436	91.3271	117.3	0.612
			92.3101	117.4	0.628
			93.1975	116.8	0.644
15431+1340	Bu 619	140438	91.3273	6.6	0.713
			92.3075	6.3	0.711
			93.2057	5.7	0.699
15440+2220	Cou 106	140629	91.3273	272.8	0.398
			92.3101	272.9	0.398
15469+1904	A 2077	+19 3014	91.3273	230.3	0.550
15474+5929	A 1127	141730	91.3271	285.2:	0.316
			92.3103	288.2	0.317
15492+6032	Hu 912	142089	91.3271	72.5	0.108
			91.3298	72.7	0.111
15493+0503	A 1126	141512	91.3273	2.5	0.086
15519−1232	Hu 153	141898	91.3273	68.4	0.431
16044−1122	STF 1998 AB	144069-0	91.3273	48.3	0.626
			92.3130	54.0	0.546
16057−0617	Fin 384 Aa	144362	92.3075	20.3:	0.052
16079+1425	A 1798	144935	91.3191	14.7	0.169
16081+4524	Bu 355 AB	145246	91.3192	281.9	0.248
			92.3103	281.1	0.243
			93.1978	282.5	0.246
16085−1006	Bu 949	144892	92.3076	195.1	0.474
			93.2057	195.8	0.472
16115+0943	Fin 354	145589	91.3191	79.7	0.102
			92.3075	79.3	0.087
16115+1507	A 1799	145648	91.3191	122.5	0.698
			92.3075	121.7	0.705
16137+4638	A 1642	146327	91.3192	188.0	0.549
			92.3103	187.6	0.574
16143−1024	RST 3936 AB	145996	92.3075	263.9:	0.242

TABLE 2. (continued)

WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (o)	ρ (″)	WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (o)	ρ (″)
16173+5001	Cou 2111	234295	91.3192	34.4	0.272	17116+3916	Hu 1178 AB	155727	91.3192	191.5	0.404
			92.3129	34.0:	0.281:				92.3104	190.8	0.409
16192+4140	STT 309	147275-6	91.3191	291.3	0.309	17121+4544	Kui 79 AB	155876	92.3130	296.5	0.597
			92.3103	293.2	0.303	17136+1716	A 2087	+17 3190	92.3131	115.8	0.237
16235+3321	Bu 951 AB,C	+33 2722	91.3191	31.6	0.953	17142+0622	A 1147 AB	155925	92.3131	174.1:	0.186:
			92.3129	31.6	0.958	17157−0949	A 2592	156034	91.3301	210.2	0.333
16235+3321	VBS 26 AB	+33 2722	91.3191	55.9	0.185				92.3131	207.9	0.333
			92.3129	52.9	0.184	17161+2316	Cou 315	+23 3071	92.3104	163.6	0.168
16238+6141	STF 2054 AB	148374	91.3274	352.0	1.036	17171+4034	Cou 1295	+40 3126	91.3247	60.6	0.269
			91.3300	352.0	1.040				92.3130	61.9	0.276
			92.3102	352.0	1.047	17182+4952	Hu 669	234420	91.3192	81.8:	0.851:
16254+3724	CHARA 55	148283	93.2056	176.1	0.166	17183+5338	Swi	157103	91.3246	167.3	0.519
16272+3952	Bu 814	148552	91.3191	356.3	0.318	17184+3239	Bu 628	+32 2888	91.3247	278.3	0.482
			92.3103	356.3:	0.322:				92.3104	277.6	0.485
16296+1635	A 2084	+16 2956	91.3191	142.7	0.482	17205+4739	A 2088	+47 2462	91.3246	12.2	0.337
16300+3354	Hu 1173	148909	91.3191	47.2	0.208				92.3130	11.6	0.336
16317−0215	A 693	148943	91.3298	231.4	0.144 *	17212+2542	A 232	157256	91.3247	118.3	0.455
16318−0702	STF 3105	148931	91.3298	195.1	0.405				92.3131	118.9	0.454
16341+4227	σ Her	149630	91.3192	36.4:	0.048:	17215+2845	Kui 80	157358	91.3247	164.3	0.725
			92.3077	19.3	0.091	17215+2845	CHARA 194 Aa	157358	91.3247	120.2	0.052
			93.1978	16.6	0.111				92.3104	130.1	0.052
16367+6948	Bu 953 AB	150631	91.3274	89.1:	0.284:	17217+3958	McA 47	157482	91.3192	252.4	0.046
			92.3104	94.5:	0.290:				92.3104	303.4	0.047
16420+7353	MLR 198	151746	91.3275	112.8	0.084				93.2058	329.9	0.096
			93.1976	33.9:	0.089:	17221+2310	Cou 415	157392	91.3301	341.1	0.171
16421+2151	Hu 487	150731	91.3274	61.6	0.243				92.3104	333.6	0.183
			92.3076	62.4	0.243	17222+2605	Ho 414 AB	157429	91.3247	101.2	0.800
16422+4112	STF 2091	150903	91.3191	318.1	0.560				92.3131	101.5	0.804
			92.3077	319.0:	0.553:	17224+2056	Cou 201 AB	157430	92.3131	256.3	0.542
16429+0005	RST 5415	150732	91.3298	345.0	0.269	17237+3709	McA 48 Aa	157779	91.3276	2.2	0.165
16437+5132	Hu 664	151267	91.3274	302.3	0.484	17238+2155	Hu 671	157683	91.3276	264.1	0.802
			92.3103	303.0	0.487				92.3131	263.7	0.810
16442+2331	STF 2094 AB	151070	91.3191	73.7	1.223	17240−0921	RST 3972	157498	91.3301	147.3	0.081
			92.3103	73.5	1.220				92.3131	192.9	0.094
16446+7145	MLR 182	152027	91.3300	314.9	0.162	17241+3834	Hu 1179	157853	91.3276	280.5	0.160
16450+2928	Cou 490	151236	91.3191	4.1	0.204				92.3104	280.1	0.170
16450+3842	Cou 1284	+38 2830	91.3191	200.8	0.184				93.2058	279.7	0.176
16458−0046	A 1141	151168	91.3298	46.2	0.107	17263+6746	Bu 1201	158867	91.3301	344.9	0.094
16476+4255	Cou 1452	+43 2646	91.3191	290.0	0.300	17268+2625	Cou 1455	+26 3018	92.3131	8.3	0.257
16511+0925	STF 2106	152113	91.3274	177.7	0.632	17276+2624	Cou 498	+26 3022	92.3131	45.8	0.428
			92.3103	177.6	0.644	17290+3845	Cou 1297	+38 2943	91.3301	94.6	0.296
16515+0113	STT 315	152127	91.3300	328.7	0.366				92.3130	94.5	0.303
			92.3076	327.5	0.385	17293+3758	Ho 417	158755	91.3301	134.5	0.362
			93.2057	326.6	0.407				92.3130	134.7	0.361
16539+2547	Cou 492	+26 2915	91.3191	91.3	0.555	17294+2924	A 351	+29 3029	91.3301	249.4	0.675
16540+2906	A 350	152747	91.3247	146.3	0.573				92.3131	250.2	0.661
			92.3076	146.5:	0.576:	17303−0103	STF 2173	158614	91.3248	331.6	1.099
16554−0820	Kui 75	152751	91.3301	102.7:	0.211:				92.3131	331.0	1.090
16563+6502	STF 2118	153697	91.3246	68.8	1.119	17308+0349	A 2247	158735	92.3131	0.5:	0.293:
16566+5711	A 1143 AB	153495	91.3246	253.2	0.436	17313+1901	Cou 499	158956	92.3104	50.0	0.135
16576+4935	Cou 1772	153536	91.3192	256.3	0.270	17323+2849	A 352	159240	91.3301	358.9	0.148
16584+3943	Cou 1289	153527	91.3192	255.8	0.114				92.3104	357.5	0.148
			91.3300	257.0	0.111				93.2058	351.9:	0.150:
			92.3077	253.7	0.109	17326+3445	Hu 1181	159304	91.3301	163.6	0.116
16594+1419	STT 321	153499	91.3247	11.8	0.557				92.3104	163.9	0.093
16595+0942	Bu 1298 AB	153475	91.3247	123.9	0.428	17335+5734	MLR 571	159870	91.3301	328.2	0.120
			92.3103	125.6	0.437				92.3104	323.6	0.113
17052+6947	A 1146	155090	91.3246	122.7	0.402	17345+3935	Cou 1298	+39 3164	91.3276	75.4	0.271
			92.3103	120.5	0.405				92.3130	75.2	0.272
17063+2631	A 228	154760	91.3219	185.2:	0.203:	17365+4543	Cou 1595	160214	92.3104	258.2	0.451
			92.3076	183.5	0.221	17366+0722	A 1156	159857	92.3104	355.8	0.147
17075+3810	Cou 1291	155039	91.3192	258.4	0.138	17370+2753	Kui 83 AB	+27 2853	91.3301	195.2	0.299
17081+3555	Hu 1176 AB	155103	91.3192	312.3	0.057				92.3131	182.8	0.316
			91.3300	310.9	0.058	17371+6707	STF 2207	160862	91.3301	115.7	0.527
			92.3077	156.2	0.057				92.3104	114.7:	0.518:
			93.2056	128.6	0.112	17374+1233	Bu 1121	160058	92.3131	205.2	0.499
17082−0105	A 1145	154895	91.3247	4.5	0.518	17399−0039	Bu 631	160438	91.3220	110.5	0.159
			92.3076	3.1	0.538				92.3132	107.4	0.166
17088+6543	ζ Dra	155763	91.3300	24.9	0.098 *	17418+2130	Cou 114	160935	91.3220	36.6	0.272
			92.3103	29.0:	0.075:				92.3132	35.4	0.262
17095+4047	McA 45	155410	90.2677	167.5	0.051	17422+4423	Cou 1596	+44 2754	91.3301	98.7	0.169
			91.3192	182.6	0.054				92.3132	99.6:	0.167:
			91.3300	180.0	0.054	17436+2237	Hu 1285	161258	91.3276	220.0	0.560
17109+4044	Cou 1293	+40 3112	91.3247	4.3	0.240	17449+6628	Hu 924	+66 1047	91.3301	207.1:	0.294:
17115+4914	Cou 1775	+49 2600	91.3192	79.1	0.414	17456+3032	Ho 70	161675	91.3301	92.6	0.424
						17471+4215	A 697	162051	91.3276	117.7	0.526

TABLE 2. (continued)

WDS α, δ (2000)	Discoverer Designation	HD/DM	Date (1900+)	θ (°)	ρ (″)	
17472+1742	STF 2215	161833	91.3275	262.6	0.548	
			93.2058	261.7	0.545	
17486+3536	Hu 1182	+35 3074	91.3192	322.0	0.596	
17490+3704	Cou 1145	162338	91.3192	129.0	0.150	
			92.3132	123.8	0.163	
			93.2058	117.5:	0.170:	
17505+0715	STT 337	162405	91.3302	173.9	0.440	
17505+3651	Cou 1146	162667	91.3192	153.2	0.243	
17512+3821	Hu 1183	+38 3012	91.3192	188.4	0.456	
17519+0724	A 1164	162670	91.3302	42.9	0.382	
17523+4057	A 699	+40 3230	91.3301	32.7	0.173	
			92.3132	30.0	0.167	
17528+2941	AC 8	163032	91.3193	278.3	0.188	
			92.3132	279.0	0.186	
17530+4212	Cou 1599	+42 2942	91.3302	128.1	0.604	
17533+2500	A 235	163077	91.3193	88.4	0.383	
17543+1108	Fin 381	163151	92.3132	329.7	0.099	
17556+4108	Cou 1601 Aa	+41 2928	91.3302	64.6	0.537	
17556+2508	Cou 503	163529	91.3193	94.8	0.362	
17563+0259	A 2189	163471	91.3302	359.6	0.095	
17564+1820	McA 49 Aa	163640	92.3132	72.8	0.093	
17572+2400	McA 50	163840	76.3674		<0.066	*
			76.5503		<0.066	
			76.6158		<0.066	
			76.6213		<0.066	
			77.3285		<0.066	
			78.3169		<0.056	
			79.1904		<0.056	
			82.5028		<0.036	
			83.4203		<0.036	
			83.7098		<0.036	
			84.3759		<0.036	
			84.3840	201.8	0.065	
			86.4100	175.0	0.106	
			87.2728		<0.036	
			87.7617		<0.036	
			88.2612	158.2	0.085	
			88.6655	169.1	0.101	
			89.2385		<0.036	
			90.2733		<0.031	
			89.7084	3.3	0.067	
			90.7542	167.0	0.093	
			91.3193	178.1	0.098	
			92.3077		<0.036	
			93.2059	342.6	0.102	
17575+1058	Bu 1299 AB	+10 3337	91.3302	68.5	0.234	
17584+0427	Kui 84	+04 3562				*
17594+2929	Cou 1003 Aa	+29 3160	91.3193	47.4	0.197	
18000+2449	Cou 115	+24 3298	91.3193	113.8	0.275	
18033+3921	STF 2275	+39 3308	91.3192	255.4	0.106	
			92.3132	261.6	0.111	
18043+4205	Cou 1786	165503	91.3276	205.2	0.102	
			92.3132	213.6	0.105	
			93.2059	219.1	0.105	
18044+0337	A 2257	165110	91.3302	0.2	0.085	
18059+2126	STT 341 AB	165590	91.3193	92.2	0.472	
			92.3132	92.8	0.448	
			93.2059	92.8	0.421	
18063+3824	Hu 1186	+38 3077	91.3192	106.0	0.412	
18075+1939	STT 524	165886	91.3193	218.9	0.348	
18086+1839	Hu 314	166157	91.3193	90.8	0.286	
18097+5024	Hu 674	166820	91.3302	224.1	0.732	
18109+3321	Cou 1005 AB	+33 3042	92.3132	302.1	0.235	
18117+3327	B 2545 AB	166988	92.3077	98.8	0.063	
18163+3625	Hu 1291	+36 3076	92.3132	131.6	0.121	
18211+7244	χ Dra	170153	92.3132	223.3	0.144	
18253+4845	Hu 66 AB	170109	91.3248	244.8	0.299	
			92.3132	243.6	0.295	
18253+4845	STT 351 AC	170109	91.3248	19.0	0.713	
			92.3132	19.4	0.720	
18261+0046	Bu 1203	169725	91.3248	146.9	0.420	
18280+0612	CHARA 71	170200	93.2059	205.1	0.065	
18291+0408	A 581 AB	+04 3760	91.3248	123.5	0.359	
18338+1744	Hu 322 AB	171365	91.3193	84.9	0.211	
			92.3105	84.5	0.202	
18340+5221	A 1377 AB	171779	91.3248	105.6	0.260	
			92.3105	106.8	0.258	
18352+1812	CHARA 74	171623	93.2059	176.9	0.102	
18355+2336	STT 359	171745	91.3221	8.1	0.686	
18363+2143	Cou 206	342628	92.3105	117.9	0.079	
18370+1016	Hu 247	171929	91.3248	11.9	0.484	
18383+0850	Hu 198	172171	91.3248	134.4	0.472	
18384−0312	A 88 AB	172088	92.3134	191.2	0.133	
18386+1632	Ho 87 AB	172246	92.3105	57.7	0.307	
18395+4056	Cou 1607	172671	91.3248	115.4	0.174	
18410+2450	A 2988	172743	92.3105	148.8	0.085	
18413+3018	STF 2367 AB	172865	92.3105	83.7	0.234	
			93.2059	80.5	0.231	
18421+3445	B 2546 Aa	173087	91.3248	314.3	0.140	
			92.3105	316.7	0.138	
18455+0530	Fin 332 Bab	173495	92.3105	134.5	0.153	
18475+4926	Bu 971 AB	174343-4	91.3248	35.0	0.348	
18594−1250	Kui 89	176162	85.4872	100.6	0.144	'
19073+3606	ι Lyr	178475	92.3105	18.1	0.069	
19307+2758	McA 55 Aa	183912	91.8959	151.2	0.397	
			92.3105	149.5	0.400	
19419+4015	Kui 94	186307	91.8959	21.4	0.115	'
19487+1852	McA 58	187321-2	91.8959	98.5	0.419	
19489+1908	AGC 11 AB	187362	91.8960	163.9	0.243	
20102+4357	STT 400	191854	91.8932	0.4	0.344	
20143+3129	A 1204	192559	91.8932	140.5:	0.354:	
20157+5014	CHARA 93	192983	91.8932	172.6	0.107	
20158+2749	McA 60 Aa,B	192806	91.8932	142.4	0.279	
			91.9014	143.6	0.280	
20158+2749	CHARA 94 Aa	192806	91.8932	149.4	0.054	'
			91.9014	157.2	0.050	
20311+1548	A 1675	195481	91.9014	162.2	0.086	
20312+1116	DA 1 BC	195482	91.8987	320.9:	0.097:	
20331+4950	McA 61	196089	91.8932	184.0	0.059	
20397+1556	WCK Aa	196867	91.9014	211.8	0.217	
20451+1244	Bu 64 AB	197683	91.8987	166.8:	0.659:	
20462+3358	CHARA 100 Aa	197989	91.8987	350.0	0.041	'
20474+3629	McA 63 Aa	198183	91.9014	349.4	0.044	'
20598+4732	McA 65 Aa	200120	91.8988	37.0	0.198	
21118+6000	STF 2780 Aa,B	202214	91.8988	214.6	1.053	
21118+6000	McA 67 Aa	202214	91.8988	11.0	0.052	
21135+1559	Hu 767	202128	91.9014	119.3	0.144	
21145+1001	STT 535 AB	202275	91.9014	350.8	0.066	'
21187+1134	Bu 163 AB	202908	91.9014	267.5	0.228	
21192+5837	STF 2790 Aa	203338	91.8988	119.8	0.112	
21400+0911	CHARA 105	206155	91.9014	14.4	0.150	
21425+4106	Kui 108	206644	91.9014	351.5	0.185	
21446+2539	Bu 989 AB	206901	91.8932	286.5	0.184	
21502+1718	Cou 14	207652	91.9014	195.2	0.154	
22241−0451	Bu 172 AB	212404	91.9015	103.8:	0.163	
22339+6550	Hu 983	214051	91.8988	245.2:	0.058:	
22357+5312	A 1470	214222	91.8988	66.7	0.098	
22373+6913	CHARA 113	214606	91.8988	0.7	0.522	
22387+4418	Ho 295	214608	91.8988	339.0	0.201	
22408+1432	Ho 296 AB	214850	91.8989	60.7	0.481	
22570+2441	Cou 542 Aa	216963	91.8989	288.9	0.152	
23019+4219	McA 77 AB	217675	91.8988	345.8	0.195	
23191−1327	McA 74 Aa	219834	91.8933	287.4	0.146	
23305+3050	Bu 1266 AB	221264	91.8933	63.2	0.238	
			91.9015	62.8	0.239	
23322+0705	Hu 298	221445	91.8933	264.9	0.147	
			91.9015	269.3:	0.143:	
23412+4613	MLR 4	222516	91.8933	110.2	0.122	
23460+4625	McA 75 Aab	223047	91.8933	101.6	0.307	
23460+4625	McA 75 Aac	223047	91.9015	172.3	0.133	
23568+0443	A 2100	224315	91.8933	9.5	0.071	

Notes to TABLE 2

02366+1266=HR 763=McA 7: These three measurements of 31 Ari were based on reprocessing of archival video data. A combined spectroscopic/speckle orbital analysis of this very close system is now in progress, in collaboration with F. C. Fekel.

04404+1631=vB 185=CHARA 154: This confirms the discovery observation of this Hyades binary, made in 1991 (Mason *et al.* 1993a).

05271+1758=ADS 4038=McA 19 Aa: All archival data for this system were reprocessed using more powerful algorithms than earlier available, resulting in four new unresolved measures as well as the new 1991 measurement. In addition, new ρ and θ values have been determined for the observations originally published from 1986.9–1988.3 (McAlister *et al.* 1989), 1988.7–1989.2 (McAlister *et al.* 1990), and 1990.3–1990.8 (Hartkopf *et al.* 1992). The date of the 1988.2518 measurement was incorrectly given as 1988.2490 in McAlister *et al.* (1989). Orbital analysis of this system is in progress; a preliminary orbit gives a period of ~15.3 years and a semi-major axis of 0.″080.

05373+6642=Mlr 314: Published orbital elements for this system (see Table 3) yield very large residuals, especially in θ. A new set of elements, including an inclination considerably larger than that found by either Baize or Muller, has been determined; these elements are included in a paper in preparation.

06017+2224=HR 2116=CHARA 161: This confirms the discovery observation, made in 1988 (McAlister *et al.* 1993).

06212+2932=HR 2272=CHARA 165: This confirms the discovery observation, made in 1988 (McAlister *et al.* 1993).

06418+4031=ADS 5332=A 218: The orbital elements of Baize (see Table 3) do not seem to agree with published visual or speckle data; nor do they reproduce Baize's ephemeris.

07277+2127=ADS 6089=McA 30 Aa: A combined spectroscopic/speckle orbit of this system has been undertaken in collaboration with F. C. Fekel.

08017+6019=HR 3109=McA 33: The orbit by Baize (see Table 3) yields rather large θ residuals for these and earlier speckle data as well. A new set of orbital elements has been determined for a paper in preparation.

08095+3213=ADS 6623=CHARA 190 Aa: This is a new component to the wide (2.″8) pair STF 1187, discovered by F. G. W. Struve in 1829.

10453+3831=ADS 7915=Ho 532 AB+CHARA 191Aa: The Aa pair is a new component to the 0.″7 pair Ho 532. This new component was actually first resolved in 1983 (McAlister *et al.* 1987) but it was believed at the time that the measurement was of the known pair (the wide component laid outside the processor "window" of our old autocorrelator). Reprocessing of our archival video data allowed us to resolve both components in the 1983 and 1984 data sets, although both early measurements of the Aa component are quite weak.

11150+3735=ADS 8102=CHARA 192 Aa: This is a new component to the 0.″6 pair STT 232, discovered by Otto Struve in 1843. Reprocessing of archival data [whose 1987 and 1988 measurements for the wide pair were originally published in McAlister *et al.* (1989)] has allowed us to confirm this discovery and also to note that the system appears to be accelerating toward periastron.

11182+3132=ADS 8119=STF 1523 AB: An orbital analysis of ξ UMa, including both the AB pair, the astrometric companion, and the newly discovered Bc companion, has been submitted.

13175−0041=HR 5014=Fin 350: An orbital analysis of this system is in progress. This binary is comprised of a pair of F0V stars of near-zero Δm, so there is considerable uncertainty as to whether the orbit is of short-period/high-eccentricity (P~9 yr, e~0.6) or long period/low eccentricity (P~18 yr, e~0.0). The rms residuals to the speckle observations are slightly smaller for the long-period orbit, but mass sums (a^3/P^2) for the two orbits differ by just 2%, insufficient to rule out either solution on the basis of plausibility.

13197+4747=ADS 8862=CHARA 193 Aa: This appears to be a new component to the 1.″5 49-year period pair of K/M dwarfs Hu 644. This is the only one of the current crop of new interferometric binaries which has not yet been confirmed.

15245+3723=ADS 9626=CHARA 181 Aa: This confirms the discovery observation of this pair, made in 1988 (McAlister *et al.* 1993).

16317−0215=ADS 10095=A 693: Residuals to the speckle data suggest that the orbital period of this system is perhaps 10–15 years longer than the 91 years found by Baize (see Table 3) and that periastron passage occurred about 1990.

17088+6543=HR 6396=ζ Dra: Our new speckle observations of this very close interferometric binary are poorly fit by the estimated orbital elements of Zulević (see Table 3). Clearly more data are needed before a meaningful orbit of this pair can be determined.

17215+2845=HR 6466=CHARA 194 Aa: This is a new close companion to the 0.″7 pair Kui 80. The primary of this system is listed in the preliminary version of the fifth edition of the *Bright Star Catalogue* (Hoffleit & Warren 1992) as a G0 III spectroscopic binary.

17240−0921=RST 3972: The 30-year period orbit of Scardia (see Table 3) gives a poor fit to recent speckle data, as do the earlier orbits of Heintz (1981) and Starikova (1983). A 15-year period orbit (Δm for this system is ~0, so there is a 180° ambiguity in both the visual and speckle data) seems to fit the data considerably better. However, masses derived from these elements (using a distance derived from the spectral types) are much too large, while those resulting from the longer period orbit are more reasonable.

17572+2400=HR 6697=McA 50: All our CCD speckle data for this close system have been reprocessed and examined. In addition, we have listed 7 negative measures dating from observations made at the KPNO 2.1 m in the 1970's. A combined spectroscopic/interferometric orbit is now in preparation.

17584+0427=+04 3562=Kui 84: A measurement published by McAlister *et al.* (1987) dating from 1985.4872 was misidentified as being of Kui 84; the measurement actually was of Kui 89 (WDS 18594−1250). In addition, an observation of Kui 84 dating from 1988.6655 (θ=270.°6, ρ=0.″134) was published by McAlister *et al.* (1990). These data have been reprocessed, and we now believe the 1988.6655 measurement was spurious.

18594−1250=HR 7166=Kui 89: This measurement was incorrectly attributed to Kui 84 (WDS 17584+0427) by McAlister *et al.* (1987).

19419+4015=HR 7499=Kui 94: The orbital elements published by Baize (see Table 3) give quite large θ residuals to our most recent speckle data. New elements have been determined for a paper in preparation.

20158+2749=HR 7744=CHARA 94 Aa: These two observations confirm the discovery measurement of this close component, made in 1985 (McAlister *et al.* 1987), and indicate considerable motion during this interval.

20462+3358=ADS 14274=CHARA 100 Aa: This finally confirms the discovery observation of this component, made in 1983 (McAlister *et al.* 1987). A number of unresolved observations of this very close system, dating from 1979 to 1981, were published by Hartkopf & McAlister (1984).

20474+3629=ADS 14296=McA 63 Aa: Orbital analysis of λ Cyg is in preparation; a preliminary orbit gives a period of 11.8 years and a semi-major axis of 0.″049.

21145+1001=ADS 14773=STT 535 AB: A combined spectroscopic/speckle orbit of this system has been undertaken in collaboration with F. C. Fekel.

23460+4625=HR 9003=McA 75 Aa,c: With this measurement we have finally confirmed the discovery observation of this component, made by McAlister *et al.* (1984) in 1981!

*Table 2 is also presented in its complete form in the AAS CD-ROM Series, Volume 3, 1994.

Finally, in Table 3 we give $O-C$ residuals for orbital elements published within the past five years, as tabulated by Worley (1994) in his computer supplement to the *Fourth Catalogue of Orbits of Visual Binary Stars* (Worley & Heintz 1983). Dates are repeated for stars having more than one published set of orbital elements. Predicted θ and ρ values (enclosed in parentheses) are given in lieu of O−C values for the unresolved observation dates listed for WDS 17572 +2400=McA 50. Also, two possible sets of orbital elements are given by Hartkopf *et al.* (1989) for WDS 18117 +3327=B 2545 AB, hence the two entries in Table 3 for the same date and paper. The coded references in the last columns (usually based on the first three letters of the first author's name, plus the publication date) are given in full in the reference list below.

As always, we are indebted to the efforts of the telescope operators in maintaining the highest observing efficiency. We

TABLE 3. Residuals to recently published orbits.

WDS α, δ (2000)	Discoverer Designation	Date (1900+)	Δθ (o)	Δρ (″)	Orbit Reference
00335+4006	Ho 3	91.9016	5.6	0.040	BAI91a
00352−0336	Ho 212 AB	91.8934	−0.3	0.000	HAR89
00507+6415	McA 2	91.8934	16.2	0.018	BAL89
00516+2238	A 1808	91.8936	4.3	0.004	BAI89a
00550+2338	STF 73 AB	91.8936	6.2	−0.005	D&C90a
00568+6022	Bu 1099 AB	91.8934	0.6	0.001	COL92
		91.9043	0.3	0.004	
01198−0029	Fin 337 BC	91.8936	−16.4	0.004	BAI91a
01233+5808	STF 115 AB	91.9017	3.3	−0.005	HAR89
01512+2439	Ho 311	91.8936	1.8	0.002	HAR89
		91.8936	−7.2	0.087	ZUL92
02157+2503	Cou 79	91.8936	−1.6	−0.017	HAR89
		93.2047	2.1	−0.004	
02231+7021	MLR 377	91.9017	−7.8	0.010	MUL91
02366+1226	McA 7	82.7659	−0.7	0.005	BAL89
		84.7046	−11.2	0.004	
		88.6554	−13.4	0.010	
02383+4604	A 1278	91.8937	3.1	−0.005	ZUL92
02396−1153	Fin 312	91.8937	−1.6	0.000	HAR89
03337+5752	CHARA 117	91.8937	0.3	0.000	McA92
		91.9019	−0.2	−0.003	
04361+0813	A 1840 AB	91.9020	−0.5	−0.019	OLE90
04432+5932	A 1013	91.8969	−0.3	−0.006	D&C90c
05373+6642	MLR 314	91.9049	−25.7	0.004	MUL91
		93.2023	−31.0	−0.006	
		91.9049	−25.5	−0.014	BAI91c
		93.2023	−30.0	−0.028	
06171+0957	Fin 331 Aa	91.8969	−0.6	−0.007	BAI91c
06289+2014	BTZ Aa	91.8969	5.5	−0.039	BAI92a
06383+2859	McA 27	91.8969	2.9	0.030	HAR89
		93.2024	5.3	0.046	
		91.8969	2.4	0.027	BAI89b
		93.2024	4.3	0.035	
06418+3041	A 218	91.8997	−29.8	−0.189	BAI92a
06474+1812	STT 156	92.3121	−2.7	−0.043	BAI92a
06503+2410	Cou 768	91.9052	1.7	−0.027	BAI89a
		93.2050	4.2	−0.003	
07352+3058	STT 175 AB	91.8943	1.5	0.003	HAR89
		92.3068	1.8	−0.002	
		93.1967	1.6	0.001	
07518−1352	Bu 101	91.9052	0.1	0.006	HAR89
		93.1968	−0.1	0.004	
07561+2342	Cou 929	92.3068	−3.6	0.008	BAI92b
		93.1967	−4.4	0.002	
07573+0108	STT 185	91.9052	2.0	−0.004	D&L92
		93.1968	−3.5	−0.007	
08017+6019	McA 33	91.3265	15.1	−0.003	BAI93a
		91.8943	11.3	−0.005	
		92.3124	10.2	−0.007	
08214−0136	STF 1216	91.3239	−0.4	0.006	D&L91
08231+2001	Ho 525 AB	91.9025	1.7	0.099	BAI91a
		91.9025	2.7	0.079	BAI93a
08267+2433	A 1746 BC	91.3265	−1.0	−0.006	D&L93
		92.3068	−4.1	−0.004	
		93.1967	−5.4	−0.012	
08468+0625	SP AB	92.3068	−1.0	−0.003	HAR89
		93.2026	1.0	−0.006	
08531+5458	A 1584	91.3267	−1.1	0.014	HEI91
		91.8944	−3.3	0.018	
		92.3068	−2.4	0.016	
09008+4148	Kui 37 AB	91.3210	−2.0	−0.023	HAR89
		91.8944	−2.6	−0.017	
		92.3068	−2.9	−0.018	
		93.2025	−3.5	−0.019	
09123+1459	Fin 347 Aa	91.3267	−4.0	0.000	HAR89
		91.8943	−2.6	0.005	
		92.3068	−0.3	0.000	
09379+4554	A 1765	91.3295	−0.2	−0.033	BAI91c
		91.9027	1.4	−0.044	
		92.3070	1.0	−0.048	
		93.2051	−3.4	−0.048	
09474+1134	McA 34	91.3267	20.7	0.026	HAR89
		91.9052	6.8	0.024	
		92.3068	4.4	0.021	
		92.3125	1.5	0.018	
		93.2026	−1.1	0.019	
		91.3267	−3.5	−0.012	BAI89b
		91.9052	−2.1	−0.009	
		92.3068	−1.2	−0.007	
		92.3125	−4.0	−0.010	
		93.2026	−3.9	0.001	
10083+3137	Kui 48 AB	91.8945	3.8	−0.006	BAI93b
		92.3069	1.7	−0.009	
		93.2025	2.7	−0.006	
10427+0335	A 2768	91.3212	−2.5	0.010	HAR89
		91.9053	−0.7	0.005	
		92.3097	−0.6	0.009	
		92.3126	−0.5	0.007	
		93.1969	−1.7	0.010	
10585+1711	A 2375	91.3268	11.2	0.055	BAI89a
11136+5525	A 1353	91.3241	0.0	0.007	D&L94
		91.9053	−0.3	0.005	
		92.3125	0.1	0.009	
11191+3811	CHARA 133	93.1970	−3.2	−0.001	McA93
11308+4117	STT 234	91.3295	0.2	−0.009	COU89
		91.9053	0.9	−0.008	
		92.3071	0.6	−0.007	
		93.1970	0.5	−0.007	
11520+4806	Hu 731	91.3241	−1.1	0.124	D&L92
11551+4629	A 1777 AB	91.3213	−4.8	0.030	BAI91a
		91.3269	−6.6	0.029	
		91.9053	−9.7	0.020	
		92.3071	−12.5	0.023	
		93.1970	−17.0	0.025	
12160+4807	Hu 736	91.3213	−38.3	−0.002	BAI93b
		92.3073	−43.1	0.002	
		91.3213	−0.2	−0.018	SCA93
		92.3073	−4.9	−0.020	
12199−0040	McA 37	91.3186	6.1	−0.005	BAI89b
		92.3098	8.6	0.003	
		91.3186	−2.0	−0.001	HAR92
		92.3098	−2.2	0.005	
13100+1731	STF 1728 AB	91.3187	−0.3	0.000	HAR89
		91.3269	−0.1	0.000	
		92.3098	−0.3	−0.001	
		92.3127	−0.2	−0.001	
		93.1973	−0.4	−0.003	
13202+1747	A 2166	91.3187	1.1	−0.009	BAI89c
		92.3098	1.1	−0.009	
		92.3127	1.0	−0.008	
		93.1971	1.1	−0.013	
13258+4430	A 1609 AB	91.3187	−0.2	−0.007	HEI91
		92.3101	0.3	−0.006	
		92.3129	0.1	−0.004	
13320+3109	Wor 24	90.2704	4.0	−0.006	BAI91a
		91.3270	−4.9	0.028	
14138+3100	Cou 606	91.3188	0.9	0.016	D&L92
		92.3099	2.1	0.020	
14323+2641	A 570	92.3073	−2.7	0.004	HEI91
		93.1975	−2.2	0.006	
14403+2158	McA 40	92.3074	−6.5	0.003	BAI89b
		93.1975	−5.1	−0.002	
		92.3074	−9.2	0.008	BAL89
		93.1975	−6.1	−0.002	
14534+1543	STT 288	91.3217	0.3	−0.025	ZUL90
15136+3453	Ho 60	91.3297	−1.7	−0.008	BAI93b
		92.3101	2.1	−0.007	
15307+3810	Hu 1163	91.3271	0.8	0.007	COU90
		92.3102	9.3	0.010	
		93.1976	5.4	0.013	
15318+4053	A 1634 AB	92.3102	19.7	−0.009	HAR89
		93.1976	9.3	0.004	
15361+3948	STT 298 AB	91.3218	−1.2	−0.011	COU89
		92.3102	−1.2	0.000	
		93.1976	−2.0	0.000	
15370+6426	Hu 1168	91.3270	−7.3	0.029	BAI92a
15390+2545	Cou 612	91.3219	−2.0	0.034	BAI92b
		92.3101	0.0	0.016	
		93.1975	0.5	0.025	

TABLE 3. (continued)

WDS α, δ (2000)	Discoverer Designation	Date (1900+)	Δθ (°)	Δρ (″)	Orbit Reference	WDS α, δ (2000)	Discoverer Designation	Date (1900+)	Δθ (°)	Δρ (″)	Orbit Reference
15420+0028	A 2176	91.3273	−8.1	0.010	BAI93b	17563+0259	A 2189	91.3302	1.0	−0.002	D&C91
		91.3298	−5.3	0.011		17572+2400	McA 50	76.3674	(161.8)	(0.098)	BAI93b
		92.3075	−4.0	0.005				76.5503	(168.2)	(0.103)	
		93.1974	−1.9	0.005				76.6158	(170.4)	(0.103)	
15428+2618	STF 1967	91.3271	−0.3	−0.001	HAR89			76.6213	(170.6)	(0.103)	
		92.3101	0.2	−0.003				77.3285	(210.1)	(0.056)	
		93.1975	−0.1	−0.002				78.3169	(108.8)	(0.025)	
15492+6032	Hu 912	91.3271	1.2	0.003	BAI92a			79.1904	(176.6)	(0.098)	
		91.3298	1.4	0.006				82.5028	(279.6)	(0.041)	
16057−0617	Fin 384 Aa	92.3075	−24.8	0.004	BAI92a			83.4203	(155.4)	(0.084)	
16137+4638	A 1642	91.3192	−0.7	0.063	BAI92b			83.7098	(166.8)	(0.103)	
		92.3103	−0.5	0.077				84.3759	(196.1)	(0.070)	
16254+3724	CHARA 55	93.2056	−0.3	0.008	McA93			84.3840	5.1	−0.004	
16300+3354	Hu 1173	91.3191	−4.7	−0.010	ZUL91			86.4100	−2.3	0.009	
16317−0215	A 693	91.3298	23.2	0.006	BAI91a			87.2728	(273.1)	(0.040)	
16341+4227	σ Her	91.3192	−10.4	0.005	BAI89b			87.7617	(355.2)	(0.035)	
		92.3077	−8.1	0.016				88.2612	0.8	−0.004	
		93.1978	−3.1	0.014				88.6655	−3.0	−0.001	
		91.3192	−6.2	0.005	BAL89			89.2385	(201.2)	(0.064)	
		92.3077	−5.2	0.004				89.7084	82.6	0.026	
		93.1978	−1.3	0.003				90.2733	(72.3)	(0.017)	
16515+0113	STT 315	91.3300	−0.1	0.002	D&L91			90.7542	5.8	−0.004	
		92.3076	0.3	0.001				91.3193	−3.7	0.008	
		93.2057	0.6	0.006				92.3077	(315.1)	(0.051)	
17075+3810	Cou 1291	91.3192	−3.7	0.013	BAI93c			93.2059	−1.6	0.002	
17081+3555	Hu 1176 AB	91.3192	−1.2	−0.007	HAR89	18043+4205	Cou 1786	91.3276	−1.2	−0.012	COU93
		91.3300	−1.9	−0.005				92.3132	−0.1	−0.013	
		92.3077	−0.9	0.001				93.2059	−0.8	−0.016	
		93.2056	0.6	−0.006				91.3276	−0.3	−0.007	BAI93c
		91.3192	0.4	−0.010	CES90			92.3132	−1.4	−0.002	
		91.3300	−0.4	−0.008				93.2059	−5.1	0.003	
		92.3077	−1.5	0.005		18063+3824	Hu 1186	91.3192	0.8	0.033	BAI92c
		93.2056	1.8	−0.006		18117+3327	B 2545 AB	92.3077	−10.0	0.011	BAI89a
17088+6543	ζ Dra	91.3300	−59.9	0.031	ZUL93			92.3077	4.9	0.004	HAR89
		92.3103	66.2	0.008				92.3077	7.8	−0.009	HAR89
17217+3958	McA 47	91.3192	4.8	0.008	BAI91a	18280+0612	CHARA 71	93.2059	−8.7	0.007	McA93
		92.3104	3.0	0.002		18384−0312	A 88 AB	92.3134	0.7	−0.006	HAR89
		93.2058	1.2	0.001		18413+3018	STF 2367 AB	92.3105	−0.3	−0.008	CES91
		91.3192	−0.8	0.010	SCA94			93.2059	−2.7	−0.024	
		92.3104	−0.2	0.002		18594−1250	Kui 89	85.4872	0.3	0.001	BAI89a
		93.2058	−0.2	−0.002		19419+4015	Kui 94	91.8959	−28.8	0.008	BAI91a
17221+2310	Cou 415	91.3301	−4.1	−0.006	BAI92b	19489+1908	AGC 11 AB	91.8960	0.7	0.000	HAR89
		92.3104	−3.3	0.004		20397+1556	WCK Aa	91.9014	−1.9	−0.006	HAR89
17240−0921	RST 3972	91.3301	−32.4	−0.055	SCA93	20474+3629	McA 63 Aa	91.9014	−2.3	−0.001	BAL89
		92.3131	−2.4	−0.048				91.9014	18.9	0.002	BAI91b
17323+2849	A 352	91.3301	2.6	0.010	D&C90d	21135+1559	Hu 767	91.9014	−1.8	−0.014	HAR89
		92.3104	3.4	0.014		21187+1134	Bu 163 AB	91.9014	0.9	0.021	CES91
		93.2058	−0.1	0.021		21425+4106	Kui 108	91.9014	0.9	−0.004	HAR89
17366+0722	A 1156	92.3104	2.8	0.000	D&C91	21446+2539	Bu 989 AB	91.8932	−0.5	−0.001	HAR89
17399−0039	Bu 631	91.3220	4.0	−0.020	BAI92a			91.8932	0.7	−0.001	CES90
		92.3132	3.3	−0.022		21502+1718	Cou 14	91.9014	0.4	0.004	HAR89
17490+3704	Cou 1145	91.3192	−0.7	0.017	BAI92a	22241−0451	Bu 172 AB	91.9015	−51.1	−0.057	BAI92a
		92.3132	1.9	0.023				91.9015	1.9	−0.003	HEI91
		93.2058	2.4	0.033		22408+1432	Ho 296 AB	91.8989	0.0	−0.003	HAR89
17505+0715	STT 337	91.3302	0.0	0.007	D&C90b			91.8989	2.9	0.000	CES90
17543+1108	Fin 381	92.3132	0.3	−0.008	BAL89	22570+2441	Cou 542 Aa	91.8989	−7.8	0.005	COU90
		92.3132	−1.6	−0.007	CES90			91.8989	−0.4	0.007	COU93
		92.3132	−6.9	0.007	BAI92a						

thank Bill Binkert, Dave Chamberlin, Hal Halbedel, Jennifer Hedden, Alex MacDonald, Jean Nowakowski, and George Will for their unflagging cooperation and sense of humor. WISE students Tatiana Ellis and Kerry Gonzales and NOAO representative Yvette Estok joined us during our 1991 April run and assisted in obtaining some of these observations. Thanks once again to Charles Worley for "pre-refereeing" our results and for his making available the computer files of the invaluable *Washington Double Star Catalogue*. This research has also made use of the Simbad database, operated at CDS, Strasbourg, France. Research in speckle interferometry at Georgia State University is supported by the GSU College of Arts and Sciences, the Office of the Vice President for Research, and the Chancellor's Initiative Fund of the University System of Georgia. The National Science Foundation provided support for this effort through NSF Grant No. AST91-41927 to GSU/CHARA.

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