

# BBSAG Bulletin 49

1980 September 8

## 82<sup>nd</sup> List of Minima of Eclipsing Binaries

The following table lists 316 visual and 10 photoelectric minima obtained mainly during 1980 July and August by the observers

MA	Maria Andrakakou, Athens, Greece
ⓇD	Roger Diethelm, Flüh, Switzerland, photoelectric
RD	" " " " visual
ⓇE	Demetrius P. Elias, Pentali, Greece, photoelectric
DE	" " " " visual
RG	Robert Germann, Wald, Switzerland
RLe	Robert Leyman, Laval - Trahegnies, Belgium
KL	Kurt Locher, Grüt, Switzerland
GM	George Mavrofridis, Athens, Greece
DM	Dimosthenis Mourikis, Pireas, Greece
APA	Aristos Parris, Larisa, Greece
HP	Hermann Peter, Otelfingen, Switzerland
NS	Nikolaos Stoikidis, Larisa, Greece

The O - C values refer to the linear elements of the GCVS 1969, disregarding improved elements in the 1971, 1974, and 1976 supplements to the GCVS. Reductions were made mainly using the tracing paper method.

- - - - -

(footnotes to page 2 :)

- \* GCVS 1969 period erroneous, O-C according to the GCVS 1976: +.006 +.018 .000
- \*\* identity with GR 59 And recognized only recently, hence formerly mistakenly reported as "not contained in the GCVS" and reduced on a different base
- \*\*\* not contained in the GCVS 1969, O-C according to the GCVS 1976: +.057 +.070 +.069 +.061 +.063
- \*\*\*\* no period given in the GCVS 1969, O-C according to the GCVS 1974: +.084
- \*\*\*\*\* no period given by the GCVS, O-C according to the elements of BBSAG Bulletin 44, page 5: +.004:
- § O-C according to the GCVS 1969 exceeds 1 period, O - C according to the elements of BBSAG Bulletin 38, page 6: +.003 +.013 +.011 +.010

cur- rent no.	star	minimum or- der	JD hel 244...	0-C	ob- n ser- ver	cur- rent no.	star	minimum or- der	JD hel 244...	0-C	ob- n ser- ver
15574	RT And	I	4408.556	-.009	5 GM	15623		I	4479.308	-.046	6 GM
15575		I	4429.316	-.004	6 GM	15624		I	4480.314	-.053	5 GM
15576		I	4434.345	-.006	6 GM	15625		I	4481.325	-.056	5 GM
15577		I	4437.479	-.017	10 GM	15626		I	4482.337	-.057	7 GM
15578		I	4444.406	-.008	6 GM	15627		I	4483.361	-.047	7 GM
15579		I	4454.465	-.012	6 GM	15628	V 337 Aql	I	4443.516	-.101	8 (RD)
15580		I	4471.438	-.020	7 GM	15629	V 340 Aql	I	4461.458	+.091	5 KL
15581		I	4473.331	-.014	6 GM	15630	V 342 Aql	I	4452.367	-.116	8 KL
15582		I	4481.511	-.010	7 GM	15631	V 343 Aql	I	4432.437	+.002	8 HP
15583		I	4483.378	-.029	6 GM	15632	V 346 Aql	I	4425.406	-.010	7 KL
15584	UU And	I	4456.469	+.124	6 KL	15633		I	4437.564	-.022	11 KL
15585		I	4459.444	+.126	7 KL	15634		I	4466.339	-.012	8 RG
15586	XZ And	I	4458.518	-.042	6 KL	15635		I	4477.401	-.013	6 KL
15587		I	4462.592	-.039	6 KL	15636		I	4477.402	-.013	11 HP
15588	AB And	II	4437.585	+.029	9 KL	15637	V 417 Aql	II	4476.350	+.043	7 RD
15589		II	4441.569	+.028	11 KL	15638	V 479 Aql	I	4449.472	+.022	7 KL
15590		II	4442.566	+.029	11 KL	15639		I	4459.466	+.013	6 KL
15591		I	4443.392	+.025	7 RG	15640	<sup>near</sup> V 602 Aql	I	4425.461	-.037	11 KL
15592		II	4443.563	+.030	10 KL	15641	V 760 Aql	I	4451.420	+.043	6 KL
15593		I	4445.386	+.028	8 RG	15642		I	4461.479	+.024	6 KL
15594		I	4446.379	+.025	7 RG	15643	V 762 Aql	I	4454.560	*****	5 KL
15595	EP And	II	4452.558	*	8 KL	15644	V 803 Aql	I	4454.435		7 KL
15596		I	4459.439	*	6 KL	15645		II	4456.420		6 KL
15597		II	4477.404	*	6 KL	15646		II	4461.423		9 KL
15598	EX And**	I	4458.542	-.453	6 KL	15647		II	4466.427		6 KL
15599	GZ And	I	4449.468	***	7 KL	15648	V 805 Aql	I	4443.508	+.020	12 KL
15600		II	4449.633	***	12 KL	15649	RS Ari	I	4452.596	-.025	11 KL
15601		I	4451.615	***	9 KL	15650	ZZ Aur	I	4453.592	-.025	6 KL
15602		II	4454.505	***	5 KL	15651		I	4462.608	-.027	6 KL
15603		II	4456.642	***	9 KL	15652	TU Boo	II	4458.432	-.005	5 KL
15604	RY Aqr	I	4466.549	-.130	8 KL	15653		II	4458.436	-.001	12 HP
15605		I	4472.446	-.133	6 KL	15654	AC Boo	II	4443.385	-.003	6 RG
15606		I	4480.306	-.139	6 GM	15655		I	4446.372	-.011	7 RG
15607		I	4482.274	-.138	6 GM	15656		I	4452.371	-.003	6 RG
15608	XZ Aqr	I	4461.566	****	7 KL	15657		I	4470.356	+.008	6 RG
15609	CR Aqr	I	4458.448	+.212	6 KL	15658	Y Cam	I	4472.599	+.141	6 KL
15610		I	4461.513	+.189	6 KL	15659	SV Cam	I	4406.453	-.004	10 GM
15611	CX Aqr	I	4437.514	+.011	6 KL	15660		I	4409.418	-.005	7 GM
15612	CZ Aqr	I	4458.536	+.010	6 KL	15661		I	4412.382	-.006	10 GM
15613	EE Aqr	I	4437.570	+.019	5 KL	15662		I	4415.350	-.003	8 GM
15614		I	4466.568	+.004	6 KL	15663		I	4435.507	-.011	6 KL
15615	FK Aql	I	4442.433	-.047	11 HP	15664		I	4441.438	-.011	11 KL
15616	OO Aql	II	4437.488	-.055	7 KL	15665		I	4444.405	-.009	6 KL
15617		II	4441.541	-.056	11 KL	15666		I	4445.591	-.009	10 KL
15618		II	4442.558	-.053	11 KL	15667		I	4453.307	-.003	6 GM
15619		II	4443.576	-.048	10 KL	15668		I	4466.344	-.014	9 GM
15620		I	4448.395	-.044	5 RD	15669		I	4467.530	-.014	7 GM
15621		I	4449.405	-.047	11 HP						
15622		II	4466.383	-.047	8 RG						

cur- rent no.	star	minimum or- der	JD hel 244...	O-C	ob- n ser- ver	cur- rent no.	star	minimum or- der	JD hel 244...	O-C	ob- n ser- ver
15670	YZ CVn	I	4458.407	*	7 KL	15705	SS Cet	I	4476.606	-.058	7 KL
15671	RZ Cas	I	4413.556	-.006	8 GM	15706	VY Cet	II	4472.576	***	6 KL
15672		I	4437.384	-.003	10 GM	15707		II	4475.642	***	12 KL
15673		I	4444.558	.000	23 RLe	15708	AA Cet	I	4454.614	****	4 KL
15674		I	4456.513	+.002	32 RLe	15709		II	4458.618	****	8 KL
15675		I	4474.441	+.001	8 GM	15710		I	4461.595	****	7 KL
15676		I	4480.420	+.004	6 GM	15711	U CrB	I	4441.539	-.007	13 KL
15677	TV Cas	I	4437.519	-.019	8 GM	15712	TW CrB	II	4437.510	*****	6 KL
15678		I	4468.328	-.025	7 GM	15713	SW Cyg	I	4442.484	+.236	13 HP
15679	AB Cas	I	4443.556	.000	6 KL	15714	UW Cyg	I	4466.467	+.002	11 HP
15680	EP Cas	I	4476.413	-.027	7 RD	15715	ZZ Cyg	I	4448.425	-.040	6 KL
15681	V 523 Cas	II	4437.521	**	7 KL	15716		I	4477.348	-.034	7 HP
15682		I	4441.495	**	7 KL	15717	BR Cyg	I	4432.461	+.012	5 HP
15683		II	4443.531	**	11 KL	15718		I	4476.434	+.010	10 HP
15684		II	4445.576	**	8 KL	15719	CG Cyg	I	4412.404	-.025	9 NS
15685		I	4452.474	**	6 KL	15720		I	4458.477	-.025	7 HP
15686		II	4470.359	**	6 KL	15721		I	4472.363	-.025	6 KL
15687		II	4474.328	**	5 KL	15722		I	4475.5185	-.0248	34 DE
15688	U Cep	(v)I	4384.543	+.049	13 GM	15723		I	4477.418	-.019	11 HP
15689		(n)I	4389.526	+.046	10 GM	15724	KR Cyg	I	4426.481	-.012	5 GM
15690		(n)I	4394.512	+.046	15 GM	15725		I	4437.488	+.008	11 GM
15691		(n)I	4399.497	+.045	16 GM	15726		I	4443.370	-.026	7 GM
15692		(v)I	4404.492	+.054	11 GM	15727		I	4454.370	-.013	8 GM
15693		(n)I	4409.470	+.046	12 GM	15728	V 382 Cyg	I	4445.4450	+.0554	9 RD
15694		(n)I	4414.457	+.046	10 GM	15729	V 387 Cyg	I	4458.400	+.065	10 HP
15695		(v)I	4424.440	+.057	10 GM	15730	<sup>neu</sup> V 388 Cyg	I	4445.409	-.121	7 RD
15696		(v)I	4429.423	+.054	10 GM	15731	V 456 Cyg	I	4476.456	+.025	8 HP
15697		(s)I	4444.373	+.046	10 GM	15732	V 477 Cyg	I	4447.436	-.026	9 HP
15698		(v)I	4454.352	+.052	9 GM	15733	V 548 Cyg	I	4476.347	-.085	10 HP
15699		(n)I	4459.348	+.062	6 GM	15734	V 700 Cyg	I	4448.381	-.055	5 RD
15700	XX Cep	I	4442.448	-.010	11 KL	15735		II	4458.421	-.046	6 RD
15701	ZZ Cep	I	4452.440	+.002	7 RG						
15702	EG Cep	I	4445.556	+.018	13 KL						
15703	GI Cep	I	4476.386	-.024	7 RD						
15704	IO Cep	I	4476.409	+.016	7 RD						

\* no period given by the GCVS, O-C according to the elements of BBSAG Bulletin 27, p.7: +.071

\*\* not contained in the GCVS 1969, O-C according to the GCVS 1976: .000 +.001 -.014 -.007 -.003 +.005 +.001

\*\*\* GCVS 1969 period erroneous, O-C according to the GCVS 1976: -.006 -.008

\*\*\*\* not contained in the GCVS 1969, O-C according to the GCVS 1974: -.016 -.033 -.006

\*\*\*\*\* not contained in the GCVS 1969: O-C according to the GCVS 1976: -.008

(n) not  
(v) very slightly  
(s) slightly  
} disturbed according to the criteria of Crawford & Olson, PASP 91, page 413, 1979, but no correction applied to the symmetric tracing paper solution

cur- rent no.	star	minimum or- der	JD hel 244...	O-C	n	ob- ser- ver	cur- rent no.	star	minimum or- der	JD hel 244...	O-C	n	ob- ser- ver
15736	V 728 Cyg	I	4466.488	+.072	8	HP	15771	AK Her	I	4445.382	-.051	8	RG
15737	V 836 Cyg	I	4461.430	-.006	8	RD	15772		I	4475.3248	-.0369	16	DE
15738	W Del	I	4472.384	+.141	11	KL	15773		II	4479.3280	-.0382	24	DE
15739	TY Del	I	4443.587	+.012	11	KL	15774	BC Her	I	4402.438	-.271	11	HP
15740		I	4461.456	+.014	7	RD	15775	CC Her	I	4459.403	+.093	11	HP
15741	YY Del	I	4458.420	-.007	7	RD	15776	CT Her	I	4450.432	+.054	13	HP
15742	DM Del	II	4427.483	+.055	26	DE	15777	DQ Her	I	4456.507	+.014	6	KL
15743		I	4430.4373	+.0532	44	DE	15778		I	4461.538	+.011	6	KL
15744		I	4479.4400	+.0649	26	DE	15779		I	4466.573	+.011	6	KL
15745	FZ Del	I	4441.573	-.001	11	KL	15780	ES Her	I	4458.488	-.124	6	KL
15746	RR Dra	I	4432.429	+.174	13	HP	15781	GL Her	I	4459.400	+.088	8	HP
15747		I	4449.409	+.167	7	KL	15782		I	4466.431	+.085	11	HP
15748		I	4466.404	+.174	10	HP	15783		I	4466.432	+.085	6	KL
15749		I	4483.391	+.174	19	DE	15784	MT Her	I	4449.505	+.033	7	KL
15750	RZ Dra	I	4446.379	-.025	6	RG	15785		I	4452.427	+.029	6	KL
15751		I	4451.352	-.010	5	HP	15786		I	4453.412	+.039	6	KL
15752		I	4452.440	-.025	7	RG	15787		I	4476.335	+.039	6	KL
15753	TW Dra	I	4453.464	-.046	6	KL	15788	V 502 Her	I	4458.455	+.126	7	RD
15754	UZ Dra	II	4461.428	+.002	9	HP	15789		II	4461.404	+.113	8	RD
15755	AI Dra	I	4442.487	+.004	11	KL	15790	SW Lac	I	4443.403	-.127	7	RG
15756		I	4454.478	+.007	8	GM	15791		I	4452.385	-.126	7	RG
15757		I	4466.466	+.007	8	GM	15792		II	4466.337	-.126	6	RG
15758	BS Dra	*II	4443.584	+.027	10	KL	15793		I	4470.347	-.125	6	RG
15759	CM Dra	I	4453.421	**	6	KL	15794		.I	4476.434	-.131	10	HP
15760		I	4458.491	**	6	KL	15795	VX Lac	I	4437.549	-.076	11	KL
15761	S Equ	I	4438.487	+.018	11	GM	15796	CM Lac	I	4435.613	-.002	7	KL
15762		I	4469.418	+.025	6	GM	15797		I	4469.327	+.013	7	GM
15763	RX Her	II	4447.418	-.018	7	HP	15798		I	4477.346	+.009	6	HP
15764	SZ Her	I	4409.414	+.041	12	APa	15799	EW Lyr	I	4114.375	+.062	10	NS
15765		I	4413.493	+.031	13	NS	15800		I	4449.570	+.074	11	KL
15766		I	4418.402	+.031	13	NS	15801		I	4453.471	+.078	6	KL
15767		I	4418.408	+.037	13	APa	15802	GZ Lyr	I	4466.453	+.022	7	KL
15768		I	4445.404	+.036	6	RG	15803	HT Lyr	I	4438.371	-.119	5	RD
15769	TU Her	I	4451.384	-.081	6	KL	15804	IP Lyr	I	4461.411	-.020	6	RD
15770	UX Her	I	4461.404	-.070	8	RD	15805	NY Lyr	II	4438.429	+.059	9	RD
							15806	$\beta$ Lyr	I	4449.76	-.08	5	RG

\* GCVS 1969 and 1974 elements identical except doubling of period, minimum order according to 1974

\*\* GCVS elements incomplete, O-C according to Martins' elements PASP 87, p.168, 1975: -.426 -.430

current no.	star	minimum or- der	JD hel 244...	O-C	ob- n ser- ver	cur- rent no.	star	minimum or- der	JD hel 244...	O-C	ob- n ser- ver
15807	U Oph	II	4452.439	-.008	7 RG	15843	$\beta$ Per	I	4454.455	-.114	12 RG
15808		II	4479.280	-.003	6 GM	15844	RW PsA	I	4458.566	-.057	6 KL
15809	RV Oph	I	4442.477	+.001	13 HP	15845	U Sge	I	4388.342	+.005	7 GM
15810	V 451 Oph	I	4443.361	-.003	7 RG	15846		I	4398.483	+.004	11 GM
15811	V 502 Oph	I	4446.374	-.043	7 RG	15847		I	4415.390	+.008	8 GM
15812		I	4480.373	-.050	6 GM	15848		I	4442.436	+.008	12 HP
15813	V 508 Oph	II	4432.430	+.003	8 HP	15849		I	4459.355	+.025	7 GM
15814		II	4435.540	+.010	7 KL	15850	CW Sge	I	4438.410	*	7 RD
15815		I	4441.573	+.009	12 KL	15851		II	4476.361	*	7 RD
15816		II	4442.443	+.016	8 HP	15852	TTV 9 Sge <sup>etc</sup>	I	4461.386	**	6 RD
15817		I	4445.371	+.014	7 RG	15853	EG Sgr	I	4453.424	***	7 KL
15818		I	4466.391	+.002	6 RG	15854		I	4458.375	***	8 KL
15819		II	4470.366	+.012	7 RG	15855	V 505 Sgr	I	4435.572	-.025	6 KL
15820	V 913 Oph	I	4442.534	-.108	11 HP	15856		I	4441.482	-.031	11 KL
15821	V 1010 Oph	I	4449.440	-.085	8 KL	15857	RT Scl	I	4466.547	-.194	6 KL
15822		I	4453.385	-.108	8 KL	15858	RS Sct	I	4442.499	+.029	11 KL
15823		I	4461.324	-.106	10 GM	15859		I	4450.458	+.017	9 HP
15824	U Peg	I	4440.539	-.016	6 RG	15860		I	4452.442	+.008	5 KL
15825		I	4445.412	-.015	5 RG	15861		I	4458.441	+.029	8 HP
15826		I	4466.384	-.031	6 RG	15862		I	4466.404	+.021	7 HP
15827	BN Peg	I	4437.492	-.281	6 KL	15863		I	4470.376	+.008	11 RG
15828		I	4442.478	-.287	6 KL	15864		I	4470.393	+.025	8 KL
15829	BO Peg	I	4458.426	-.024	7 RD	15865		I	4476.362	+.015	8 RD
15830		I	4458.439	-.011	10 HP	15866	AO Ser	I	4476.351	+.002	6 KL
15831	DI Peg	I	4435.565	-.010	6 KL	15867	AU Ser	II	4425.445	****	9 MA
15832		I	4440.540	-.018	6 RG	15868		II	4425.445	****	9 DM
15833		I	4445.525	-.015	7 KL	15869		II	4432.402	****	7 HP
15834	DO Peg	I	4453.469	+.155	7 KL	15870		I	4438.389	****	6 RD
15835	GP Peg <sup>non</sup>	I	4476.387	-.017	8 RD	15871		II	4442.456	****	8 HP
15836	Z Per	I	4476.440	+.013	6 KL	15872		I	4450.377	****	8 HP
15837	RT Per	I	4472.627	-.069	6 KL	15873	X Tri	I	4452.592	-.041	9 KL
15838	WY Per	I	4458.563	-.031	6 KL	15874		I	4453.564	-.041	8 KL
15839	XZ Per	I	4449.509	+.004	6 KL	15875		I	4458.420	-.043	6 KL
15840		I	4472.551	+.013	6 KL	15876	RW Tri	I	4461.530	-.001	6 KL
15841	BY Per	I	4461.426	+.170	7 KL	15877		I	4466.630	-.002	6 KL
15842	KW Per	I	4476.387	+.046	7 KL	15878	UX UMa	I	4425.468	.000	6 KL
						15879		I	4453.395	-.001	6 KL
						15880	AC UMa	I	4461.560	+.302	8 KL

\* GCVS 1969 period too inaccurate for reasonable reduction, O-C according to the GCVS 1974: -.002 -.022

\*\* not contained in the GCVS, O-C according to Calv's elements, Tartu Astrofüüsika Observatoorium, 1979: -.002

\*\*\* O-C according to the GCVS but with half its period (see BBSAG Bulletin 42, p.4): -.157 -.178

\*\*\*\* GCVS 1969 period too inaccurate for reasonable reduction, O-C according to the GCVS 1974: -.007 -.007 -.008 -.011 -.002 -.005

current no.	star	minimum or-der	JD hel 244...	O-C	observer	current no.	star	minimum or-der	JD hel 244...	O-C	observer
15881	Z Vul	I	4442.518	+0.004	10 HP	15892	BU Vul	I	4459.477	-0.003	9 HP
15882		I	4447.433	+0.009	10 HP	15893	DR Vul	II	4443.4703	+0.1582	19 RD
15883		I	4452.364	+0.030	7 RG	15894	FM Vul	I	4458.454	+0.027	7 RD
15884	AW Vul	I	4452.400	-0.021	7 KL	15895	GI Vul	I	4461.429	-0.015	7 RD
15885		I	4472.560	-0.022	6 KL	15896	GP Vul	I	4477.357	-0.027	6 KL
15886	AX Vul	I	4454.492	-0.009	6 KL	15897	KN Vul	II	4461.459	-0.036	8 RD
15887		I	4456.515	-0.011	11 KL	15898	NO Vul	I	4451.506	*	7 KL
15888	AY Vul	I	4458.527	+0.032	7 KL	15899		I	4458.376	*	6 RD
15889	BE Vul	I	4466.429	+0.017	9 HP	* not contained in the GCVS 1969, O-C according to the GCVS 1976: +0.021 +0.032					
15890	BO Vul	I	4438.391	-0.085	8 RD						
15891		I	4473.420	-0.082	24 DE						

D P C e p h e i , a R e i n t e r p r e t a t i o n

The GCVS elements of this EA binary, 2433622.302 + .558630 E, seem to be based entirely on Ashbrook's work (Astronomical Journal 57, p.259, 1952, where the star is designed as belonging to Cassiopeia), which is itself quite a poor material, namely one certain minimum and 6 single photographic weakenings spread as wide as over 1380 times the pretended period.

My recent visual survey has yielded 2 distinct minima, JD 2444485.524 and ..89.337, the interval of which contradicts the GCVS period, as well as two branches covered and sufficient maximum phase monitoring as to exclude ambiguity. Fig. 52 shows quite convincingly the proposed elements

$$2444485.524 + 1.906 E$$

to be correct, although this period disagrees with at least 2 of the 6 intervals of weakened light found by Ashbrook. Accessorily it yields

$$D/p = .11 \pm .01 \quad \& \quad d = 0$$

K. Locher

Fig. 52

