MINIMA OF ECLIPSING BINARY STARS, IV

MARVIN E. BALDWIN
Butlerville, IN 47223

This report continues that given in J.A.A.V.S.O. 5, No. 1. This work is sponsored by the AAVSO with the writer acting as program coordinator. This listing contains 242 observed heliocentric minima of 59 eclipsing binary stars derived from observations submitted by participants in the AAVSO's eclipsing binary program. Included are two minima of HU Tauri inadvertently omitted from the previous list. All are visual minima reduced by the writer using the tracing paper method. Heliocentric corrections were checked by Howard Landis and Peter Taylor. Except where otherwise noted, O - C's are computed using the linear elements given in the main listing of the 1969 General Catalog of Variable Stars without regard to additional linear elements which might appear in the notes following the main listing and without regard to more recent elements which may be listed in the supplements to the Catalog. The number of estimates used for each minimum is given under n.

J.D. hel. 2,400,000+	E	O - C	n	Observer
RT Andromedae				
41986.539	13839	-0.013	15	D.Sharpe
41986.545	13839	-0.007	6	B.Small
41989.688	13844	-0.008	10	M.Baldwin
41991.568	13847	-0.015	10	B.Small
41991.573	13847	-0.010	8	M.Baldwin
42008.549	13874	-0.015	9	B.Small
42030.563	13909	-0.014	12	B.Small
42047.551	13936	-0.006	7	B.Small
XZ Andromedae				
41985.568	2085	+0.002	18	D.Sharpe
42004.558	2099	-0.010	16	M.Baldwin
AB Andromedae				
41876.702	17376.5	+0.016	8	P.Atwood
41978.598	17683.5	+0.021	9	M.Baldwin
41979.592	17686.5	+0.019	8	M.Baldwin
41980.593	17689.5	+0.025	12	B.Small
41981.585	17692.5	+0.021	9	B.Small
41982.574	17695.5	+0.014	9	M.Baldwin
41983.582	17698.5	+0.027	7	B.Small
41985.567	17704.5	+0.020	14	B.Small
41986.561	17707.5	+0.019	6	B.Small
41989.548	17716.5	+0.019	11	M.Baldwin
41990.540	17719.5	+0.015	8	M.Baldwin
41991.541	17722.5	+0.020	9	B.Small
42004.655	17762	+0.025	7	B.Small
42008.631	17774	+0.018	9	B.Small
42014.605	17792	+0.018	9	B.Small
42020.582	17810	+0.021	14	M.Baldwin
42028.548	17834	+0.022	7	B.Small
42029.540	17837	+0.018	6	B.Small
42030.535	17840	+0.017	8	B.Small
CX Aquarii				
41898.883	9794	+0.008	15	D.Sharpe
41950.591	9887	+0.009	13	Y.Fernandez
41990.624	9959	+0.011	18	M.Baldwin
42004.525	9984	+0.013	11	M.Baldwin
XZ Aquilae				
41892.759	3746	+0.021	10	T.Cragg
41952.665	3774	+0.030	16	E.Mayer

J.D. hel. 2,400,000+	E	O - C	n	Observer
OO Aquilae				
41928.623	15792	-0.038	9	E.Mayer
41934.720	15804	-0.022	16	T.Cragg
41977.534	15888.5	-0.032	9	M.Baldwin
41978.543	15890.5	-0.037	13	M.Baldwin
41979.557	15892.5	-0.036	14	M.Baldwin
41980.575	15894.5	-0.032	11	M.Baldwin
41980.575	15894.5	-0.032	12	B.Small
41981.592	15896.5	-0.029	11	B.Small
41982.602	15898.5	-0.032	9	B.Small
41983.618	15900.5	-0.030	9	B.Small
41996.542	15926	-0.029	7	B.Small
V342 Aquilae				
41956.708	1865	-0.030	15	T.Cragg
V346 Aquilae				
41870.805	9528	-0.014	8	P.Atwood
41890.723	9546	-0.010	9	T.Cragg
41941.616	9592	-0.010	11	E.Mayer
41961.530	9610	-0.011	7	M.Baldwin
41972.597	9620	-0.007	12	M.Baldwin
41982.552	9629	-0.009	12	M.Baldwin
RX Arietis				
42011.537	3509	+0.010	8	B.Small
42012.571	3510	+0.014	14	B.Small
42045.521	3542	+0.016	7	B.Small
42046.545	3543	+0.010	9	B.Small
42047.597	3544	+0.033	6	B.Small
WW Aurigae				
41708.628	3470.5	+0.010	10	E.Mayer
41713.676	3472.5	+0.007	13	K.Simmons
41717.447	3474	-0.009	14	M.Baldwin
41737.632:	3482	-0.024:	8	K.Simmons
AR Aurigae				
41982.806	3686	+0.013	18	M.Baldwin
Y Camelopardalis				
41725.622	1761	+0.056	14	E.Mayer
SV Camelopardalis				
41727.555	13405	+0.003	12	J.Bortle
41759.574	13459	-0.004	6	B.Small
41989.687	13847	-0.003	9	M.Baldwin
42004.516	13872	0.000	8	M.Baldwin
42008.656	13879	-0.012	6	B.Small
42018.753	13896	+0.003	16	R.Harvin
AL Camelopardalis				
42016.778	11748	-0.005	15	R.Harvin
R Canis Majoris				
41717.588	5460	+0.003	14	B.Small
41751.677	5490	+0.014	7	E.Mayer
41759.615	5497	+0.001	16	D.Wolters
41986.806	5697	+0.004	17	R.Harvin
RZ Cassiopeiae				
41702.666	3814	+0.004	13	B.Small
41708.639	3819	+0.002	16	H.Koller
41708.640	3819	+0.002	18	E.Mayer
41708.643	3819	+0.005	13	B.Small
41720.589	3829	-0.001	16	B.Small

J.D. hel. 2,400,000+	E	O - C	n	Observer
RZ Cassiopeiae				
41769.596	3870	+0.001	16	E.Mayer
41868.803	3953	+0.002	16	R.Harvin
41886.734	3968	+0.004	18	R.Harvin
41898.686	3978	+0.004	18	H.Koller
41953.664	4024	+0.001	14	M.Baldwin
41960.842	4030	+0.007	10	K.Simmons
41971.596	4039	+0.004	12	M.Baldwin
41977.571	4044	+0.003	11	M.Baldwin
41983.548	4049	+0.003	17	M.Baldwin
41990.719	4055	+0.003	16	M.Baldwin
42008.649	4070	+0.005	11	B.Small
42014.622	4075	+0.001	10	B.Small
42020.603	4080	+0.006	17	M.Baldwin
42026.568	4085	-0.005	8	B.Small
42032.557	4090	+0.007	6	B.Small
42038.532	4095	+0.006	7	B.Small
42044.505	4100	+0.003	5	B.Small
42045.699	4101	+0.001	10	B.Small
TV Cassiopeiae				
42008.625	12077	-0.015	9	B.Small
AB Cassiopeiae				
42003.691	6136	+0.008	15	M.Baldwin
U Cephei				
41983.726	1481	+0.030	19	M.Baldwin
41983.732	1481	+0.036	37	R.Harvin
42003.678	1489	+0.038	12	M.Baldwin
42018.633[1]	1495	+0.035	16	R.Harvin
XX Cephei				
41983.584	1710	-0.013	12	B.Small
41983.598:	1710	0.000:	10	M.Baldwin
41990.601	1713	-0.008	19	M.Baldwin
42004.630	1719	-0.003	15	M.Baldwin
EG Cephei				
41765.476	27241	+0.019	9	M.Baldwin
41766.556	27243	+0.010	10	M.Baldwin
41932.664	27548	+0.009	12	E.Mayer
41980.593	27636	+0.011	17	B.Small
41980.594	27636	+0.012	9	M.Baldwin
41986.585	27647	+0.012	8	B.Small
42004.559	27680	+0.014	14	M.Baldwin
U Coronae Borealis				
41824.759	7264	-0.016	8	T.Cragg
ZZ Cygni				
41871.723	32984	-0.039	8	T.Cragg
41944.643	33100	-0.039	10	E.Mayer
41956.599	33119	-0.026	6	E.Mayer
41961.619	33127	-0.035	9	E.Mayer
V477 Cygni				
41851.665	3837	-0.009	7	P.Atwood
W Delphini				
41934.775	4970	+0.122	25	T.Cragg
TT Delphini				
41927.771	1278	+0.042	11	T.Cragg
FZ Delphini				
41941.561	13556	+0.002	9	E.Mayer

J.D. hel. 2,400,000+	E	O - C	n	Observer
Z Draconis				
41717.412	6224	-0.002	12	M.Baldwin
AI Draconis				
41886.605	2360	-0.007	10	R.Harvin
YY Eridani				
41687.544	25101.5	-0.013	7	B.Small
41689.653	25108	+0.006	6	B.Small
41690.604	25111	-0.007	8	B.Small
41696.551	25129.5	-0.008	8	B.Small
41702.663	25148.5	-0.004	10	B.Small
41703.628	25151.5	-0.004	9	B.Small
41705.394	25157	-0.006	12	M.Baldwin
41717.616	25195	-0.001	12	B.Small
41718.578	25198	-0.003	6	B.Small
41719.541	25201	-0.005	11	B.Small
41721.634:	25207.5	-0.002:	7	B.Small
41730.626:	25235.5	-0.012:	7	B.Small
41735.613	25251	-0.008	11	B.Small
41744.617	25279	-0.006	10	B.Small
41745.578	25282	-0.009	10	B.Small
41746.544	25285	-0.007	12	B.Small
41754.582	25310	-0.007	13	B.Small
41759.568	25325.5	-0.004	5	B.Small
41760.534	25328.5	-0.003	5	B.Small
42044.574	26212	-0.005	11	B.Small
42045.696	26215.5	-0.008	9	B.Small
42049.556	26227.5	-0.006	5	B.Small
SZ Herculis				
41956.749	8519	+0.022	16	T.Cragg
SW Lacertae				
41870.766	13401.5	-0.044	11	P.Atwood
41876.713	13420	-0.031	7	P.Atwood
41980.614	13744	-0.045	11	B.Small
41981.567	13747	-0.054	7	B.Small
41985.586	13759.5	-0.045	7	B.Small
41986.535:	13762.5	-0.058:	5	B.Small
41989.591	13772	-0.049	12	M.Baldwin
41990.553	13775	-0.049	11	M.Baldwin
41995.523	13790.5	-0.051	7	B.Small
42002.583	13812.5	-0.046	9	B.Small
42004.663	13819	-0.051	7	B.Small
42007.555	13828	-0.046	5	B.Small
42008.510	13831	-0.053	5	B.Small
42008.675	13831.5	-0.048	6	B.Small
42011.563	13840.5	-0.047	8	B.Small
42012.520	13843.5	-0.052	7	B.Small
42020.544	13868.5	-0.046	10	M.Baldwin
42021.502	13871.5	-0.051	5	B.Small
42024.541	13881	-0.058	5	B.Small
42028.552	13893.5	-0.056	7	B.Small
42029.515	13896.5	-0.056	4	B.Small
42044.589	13943.5	-0.055	10	B.Small
42045.546	13946.5	-0.061	6	B.Small
42046.504	13949.5	-0.065	5	B.Small
42049.563	13959	-0.053	5	B.Small
VX Lacertae				
41971.592	7210	-0.047	13	M.Baldwin
CM Lacertae				
42020.553	9344	-0.001	12	M.Baldwin

J.D. hel. 2,400,000+	E	O - C	n	Observer
Y Leonis				
41750.633	4781	+0.073	22	E.Mayer
41819.769	4822	+0.080	10	T.Cragg
T Leonis Minoris				
41773.500	5933	-0.089	12	M.Baldwin
Delta Librae				
41738.843	8115	+0.014	16	D.Wolters
41738.849	8115	+0.020	12	R.Sweetsir
41745.812	8118	+0.001	12	D.Wolters
41745.819	8118	+0.008	13	R.Sweetsir
41759.794:	8124	+0.018:	10	K.Simmons
EW Lyrae				
41937.616	3566	+0.042	12	E.Mayer
FL Lyrae				
41950.586:	1712	+0.033:	8	E.Mayer
RU Monocerotis				
41696.621	3363	-0.088	9	B.Small
41741.575	3375.5	+0.058	10	E.Mayer
U Ophiuchi				
41851.710	20015	-0.011	7	P.Atwood
41888.633	20037	+0.010	8	R.Harvin
41898.694	20043	+0.007	13	H.Koller
ER Orionis				
41705.382	12273.5	-0.014	8	M.Baldwin
41719.559	12307	-0.021	13	B.Small
41730.574	12333	-0.015	10	B.Small
41745.602	12368.5	-0.017	6	B.Small
41759.578	12401.5	-0.014	9	B.Small
42004.728	12980.5	-0.013	8	B.Small
42045.581	13077	-0.018	9	B.Small
FT Orionis				
41717.286	2764	+0.016	7	M.Baldwin
U Pegasi				
41985.548	14605.5	+0.002	13	B.Small
RT Persei				
41979.627	20516	-0.059	8	M.Baldwin
41985.583	20523	-0.049	18	D.Sharpe
41990.673	20529	-0.055	17	M.Baldwin
RV Persei				
41717.349	11348	+0.013	8	M.Baldwin
41989.692	11496	+0.015	17	M.Baldwin
ST Persei				
41983.717	1092	+0.003	13	M.Baldwin
XZ Persei				
41982.716	14616	+0.009	11	M.Baldwin
41989.619	14622	+0.002	16	M.Baldwin
Beta Persei				
41707.534:	777	-0.075:	12	E.Mayer
42008.642	882	-0.043	12	B.Small
Y Piscium				
41978.646	1845	+0.127	15	M.Baldwin

J.D. hel. 2,400,000+	E	O - C	n	Observer
U Sagittae				
41869.789	3774	+0.012	16	P.Atwood
RW Tauri				
41702.628	8850	-0.072	7	B.Small
41705.400	8851	-0.068	15	M.Baldwin
HU Tauri				
40985.368	7462	-0.005	10	M.Baldwin
41248.595	7590	+0.016	21	M.Baldwin
41688.637	7804	+0.011	18	B.Small
41717.424	7818	+0.009	15	M.Baldwin
X Trianguli				
41687.605	4236	-0.031	10	B.Small
41688.579	4237	-0.028	13	B.Small
41689.548	4238	-0.030	10	B.Small
41690.525	4239	-0.025	6	B.Small
41721.608	4271	-0.031	18	B.Small
41723.554	4273	-0.028	12	J.Bortle
41961.579	4518	-0.030	8	M.Baldwin
41990.725	4548	-0.030	10	M.Baldwin
42024.732	4583	-0.027	16	G.Fortier
42029.588	4588	-0.029	11	G.Fortier
42030.560	4589	-0.028	13	B.Small
W Ursae Majoris				
41727.556	8796.5	-0.079	11	J.Bortle
41766.596	8913.5	-0.076	11	E.Mayer
TX Ursae Majoris				
41717.406	824	-0.016	12	M.Baldwin
41766.422	840	-0.012	18	M.Baldwin
VV Ursae Majoris				
41742.621	6392	+0.055	10	E.Mayer
41753.621	6408	+0.057	10	E.Mayer
41766.680	6427	+0.056	11	E.Mayer
41788.678	6459	+0.059	9	E.Mayer
XZ Ursae Majoris				
41748.546:	12569	-0.063:	10	E.Mayer
41765.662	12583	-0.059	26	E.Mayer
BU Vulpeculae				
41986.644	14856	+0.006	10	B.Small
42006.559	14891	+0.006	9	B.Small
42039.553	14949	-0.002	5	B.Small

1. The usual constant phase did not occur during this minimum according to Harvin's observations.