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TWX 710-320-6842 ASTROGRAM CAM \*\* Brian G. Marsden, Director  
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## IDENTIFICATION CHANGES.

Continuation to MPC 5542.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
A915 CF *	1915 02	06.98954	08 30 30.0	+23 22 35	730		029
1930 AG *	1930 01	07.86119	06 21.2	+23 13	1928 SL	16	024
1930 GL *	1930 04	01.95278	10 58 01.22	+13 59 36.1	1930 DS	14	024
1953 VV3 *	1953 11	10.10	00 30.1	-04 16	1953 VZ	15.4	760
1969 ED2 *	1969 03	12.00059	11 59 32.51	+05 24 08.8	452		095
1969 ED2	1969 03	14.95227	11 57 26.31	+05 37 20.2	452		095
1971 TD3 *	1971 10	10.78301	01 17 49.77	+07 57 30.1	1971 SW1	16.0	095
1971 TD3	1971 10	11.86116	01 17 03.80	+07 47 24.8	1971 SW1	16.0	095
1971 TD3	1971 10	21.79968	01 09 59.20	+06 14 12.9	1971 SW1	16.0	095
1971 UM4 *	1971 10	20.81372	23 45 33.75	-06 16 11.8	452		095
1975 VA10*	1975 11	06.87965	02 23 50.00	+17 57 13.3	1975 TQ4	17.0	095
1976 SB10*	1976 09	24.82376	22 04 04.62	-11 37 14.2	1976 QS	17.0	095
1976 SC10*	1976 09	24.82376	22 13 51.97	-11 33 59.8	1976 QX	17.0	095
1980 RY1 *	1980 09	09.02170	02 00 59.81	+11 55 07.2	1980 RF1		046
1980 RY1	1980 09	09.03819	02 00 58.40	+11 55 03.1	1980 RF1		046

\* \* \* \* \*

## IDENTIFICATIONS.

The following list of identifications with numbered minor planets continues that on MPC 5542.

	Note		Note		Note
1925 DA = (1579)	1	1930 DS = (1967)	1	1931 BP = (1579)	1
1950 CJ = (1010)	3	1950 EY = (1010)	3	1958 CA = (1393)	4
1974 CJ1 = (1820)	5	1977 AT2 = (628)	1	1977 TB4 = (1396)	1
1980 ME = (1646)	4				

Note 1: identification by C. M. Bardwell. 2: double designation 1950 CJ = 1950 EY by L. Oterma. 3 = 1 + 2. 4: identification by E. Bowell. 5: identification by O. Kippes.

\* \* \* \* \*

## OBSERVATIONS MADE AT UCCLE BY H. DEBEHOGNE.

Object	Date	UT	R. A. (1950)	Decl.	O - C	Obs.
1	1979 09	17.00674	01 22 03.14	-07 23 03.0	0.1+ 0	012
1	1979 09	17.01782	01 22 02.75	-07 23 06.4	0.1+ 0	012
1	1979 09	17.03444	01 22 02.12	-07 23 11.3	0.1+ 0	012
4	1979 11	11.06086	02 36 13.76	+04 30 31.5	0.0 1-	012
4	1979 11	11.07298	02 36 13.04	+04 30 30.0	0.0 1-	012
4	1979 11	11.08510	02 36 12.30	+04 30 28.4	0.0 1-	012
5	1979 03	22.02836	12 28 25.49	+03 59 55.1	0.0 1+	012

5	1979	03	22.04568	12	28	24.67	+04	00	03.4	0.0	1+	012
5	1979	03	22.06299	12	28	23.88	+04	00	11.4	0.0	1+	012
27	1979	11	11.09480	05	55	44.98	+22	15	39.0	0.6+	0	012
27	1979	11	11.11488	05	55	44.82	+22	15	40.1	0.6+	0	012
27	1979	11	11.13635	05	55	44.64	+22	15	41.1	0.6+	0	012
59	1979	03	22.08376	13	12	29.52	-02	28	30.5	0.1+	1-	012
59	1979	03	22.10108	13	12	28.78	-02	28	23.4	0.1+	1-	012
59	1979	03	22.11839	13	12	28.06	-02	28	16.2	0.1+	1-	012
174	1979	09	16.95930	01	28	43.98	+23	27	01.1	0.2+	2+	012
174	1979	09	16.97315	01	28	43.42	+23	27	02.1	0.2+	2+	012
174	1979	09	16.98700	01	28	42.83	+23	27	03.0	0.2+	2+	012
202	1979	03	22.02836	12	29	03.60	+07	26	08.5	0.1+	1+	012
202	1979	03	22.04568	12	29	02.94	+07	26	15.9	0.1+	1+	012
202	1979	03	22.06299	12	29	02.23	+07	26	22.7	0.1+	1+	012
207	1979	09	17.10058	01	42	33.43	+08	49	38.6	0.3+	1+	012
207	1979	09	17.11443	01	42	32.87	+08	49	36.7	0.3+	1+	012
207	1979	09	17.12828	01	42	32.28	+08	49	35.2	0.3+	1+	012
218	1979	03	22.08376	12	52	52.14	+02	20	25.5	0.1+	0	012
218	1979	03	22.10108	12	52	51.41	+02	20	38.7	0.1+	0	012
218	1979	03	22.11839	12	52	50.74	+02	20	52.5	0.1+	0	012
234	1979	09	17.00674	01	23	48.52	-13	06	46.9	0.3+	2-	012
234	1979	09	17.01782	01	23	48.30	-13	06	58.3	0.3+	2-	012
234	1979	09	17.03444	01	23	47.92	-13	07	15.4	0.3+	2-	012
268	1979	03	22.08376	13	01	45.60	-02	44	22.3	0.2+	2-	012
268	1979	03	22.10108	13	01	44.93	-02	44	17.6	0.2+	2-	012
268	1979	03	22.11839	13	01	44.26	-02	44	13.1	0.2+	2-	012
278	1979	03	22.02836	12	19	13.95	+10	40	39.1	0.0	1+	012
278	1979	03	22.04568	12	19	13.01	+10	40	42.9	0.0	1+	012
278	1979	03	22.06299	12	19	12.06	+10	40	46.2	0.0	1+	012
405	1979	09	16.95930	01	18	28.77	+23	21	30.3	0.1+	2+	012
405	1979	09	16.97315	01	18	28.17	+23	21	28.3	0.1+	2+	012
405	1979	09	16.98700	01	18	27.58	+23	21	25.8	0.1+	2+	012
444	1979	09	17.10058	01	29	27.74	+10	41	02.0	0.3+	2+	012
444	1979	09	17.11443	01	29	27.34	+10	40	54.6	0.3+	2+	012
444	1979	09	17.12828	01	29	26.94	+10	40	48.0	0.3+	2+	012
476	1979	09	16.95930	01	16	39.12	+25	50	43.6	0.3+	3+	012
476	1979	09	16.97315	01	16	38.49	+25	50	43.9	0.3+	3+	012
476	1979	09	16.98700	01	16	37.90	+25	50	43.8	0.3+	3+	012
507	1979	09	16.95930	01	32	21.90	+24	10	46.8	0.1+	1+	012
507	1979	09	16.97315	01	32	21.47	+24	10	47.2	0.1+	1+	012
507	1979	09	16.98700	01	32	21.07	+24	10	47.8	0.1+	1+	012
524	1979	09	16.95930	01	21	10.59	+18	55	45.6	0.3+	2+	012
524	1979	09	16.97315	01	21	10.08	+18	55	47.6	0.3+	2+	012
524	1979	09	16.98700	01	21	09.56	+18	55	49.2	0.3+	2+	012
601	1979	09	17.05210	01	24	08.28	-00	30	32.1	0.2+	1+	012
601	1979	09	17.06596	01	24	07.93	-00	30	36.6	0.2+	1+	012

OBSERVATIONS MADE AT THE PINO TORINESE OBSERVATORY UNDER THE DIRECTION OF  
V. ZAPPALA.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1	1979	09	12.89912	01 24 27.53 -07 01 06.2	022
1	1979	09	12.90190	01 24 27.44 -07 01 07.3	022
1	1979	09	12.90466	01 24 27.35 -07 01 08.8	022
1	1979	09	13.89778	01 23 54.28 -07 06 25.4	022
1	1979	09	13.90124	01 23 54.20 -07 06 26.9	022
1	1979	09	13.90470	01 23 54.02 -07 06 27.6	022
1	1979	09	18.91597	01 20 49.69 -07 33 15.8	022
1	1979	09	18.91944	01 20 49.52 -07 33 16.3	022
1	1979	09	18.92776	01 20 49.19 -07 33 20.1	022

1	1979	09	26.91423	01	15	03.53	-08	14	44.9	022
1	1979	09	26.91907	01	15	03.27	-08	14	46.2	022
1	1979	09	26.93154	01	15	02.66	-08	14	49.5	022
1	1979	10	17.85965	00	57	30.47	-09	34	56.4	022
1	1979	10	17.86450	00	57	30.27	-09	34	56.2	022
1	1979	10	17.88458	00	57	29.20	-09	34	59.4	022
1	1979	11	11.88732	00	40	38.47	-09	34	09.1	022
1	1979	11	11.89078	00	40	38.36	-09	34	08.9	022
1	1979	11	11.90740	00	40	37.90	-09	34	05.8	022
1	1979	11	19.84123	00	37	46.07	-09	09	36.5	022
1	1979	11	19.84399	00	37	46.04	-09	09	35.6	022
1	1979	11	19.86685	00	37	45.65	-09	09	30.4	022
1	1979	11	25.82554	00	36	33.89	-08	44	12.3	022
1	1979	11	25.82831	00	36	33.85	-08	44	12.4	022
1	1979	11	25.83939	00	36	33.75	-08	44	09.1	022
1	1979	12	03.84549	00	36	15.34	-08	01	58.8	022
1	1979	12	03.84722	00	36	15.34	-08	01	58.1	022
1	1979	12	03.84861	00	36	15.35	-08	01	57.5	022
1	1979	12	06.82830	00	36	30.74	-07	44	07.5	022
1	1979	12	06.83004	00	36	30.75	-07	44	07.0	022
1	1979	12	06.83177	00	36	30.76	-07	44	06.2	022
1	1979	12	06.83333	00	36	30.78	-07	44	05.8	022
1	1979	12	12.79565	00	37	36.47	-07	05	15.6	022
1	1979	12	12.79776	00	37	36.54	-07	05	15.4	022
1	1979	12	12.81919	00	37	36.84	-07	05	06.5	022
1	1979	12	16.79788	00	38	45.84	-06	37	05.0	022
1	1979	12	16.79997	00	38	45.83	-06	37	04.5	022
1	1979	12	16.82144	00	38	46.28	-06	36	54.9	022
1	1979	12	17.71370	00	39	04.54	-06	30	25.6	022
1	1979	12	17.71544	00	39	04.58	-06	30	24.8	022
1	1979	12	17.71716	00	39	04.65	-06	30	23.9	022
1	1980	01	03.83124	00	47	46.55	-04	12	56.0	022
1	1980	01	03.83332	00	47	46.64	-04	12	54.6	022
1	1980	01	03.83539	00	47	46.70	-04	12	53.6	022
1	1980	01	07.84664	00	50	32.24	-03	37	47.8	022
1	1980	01	07.86326	00	50	32.92	-03	37	38.6	022
2	1979	08	21.82972	21	03	40.50	+10	37	42.7	022
2	1979	08	21.83318	21	03	40.36	+10	37	40.3	022
2	1979	08	21.84149	21	03	39.99	+10	37	34.9	022
2	1979	09	12.83818	20	50	19.04	+06	16	56.2	022
2	1979	09	12.84164	20	50	18.91	+06	16	53.2	022
2	1979	09	12.85688	20	50	18.49	+06	16	41.4	022
2	1979	09	13.84791	20	49	52.99	+06	04	22.0	022
2	1979	09	13.85138	20	49	52.83	+06	04	19.7	022
2	1979	09	13.86176	20	49	52.61	+06	04	11.5	022
2	1979	09	18.85504	20	48	00.99	+05	02	14.2	022
2	1979	09	18.85780	20	48	00.92	+05	02	12.2	022
2	1979	09	18.87997	20	48	00.46	+05	01	56.2	022
2	1979	09	26.88444	20	46	03.87	+03	24	42.8	022
2	1979	09	26.88929	20	46	03.81	+03	24	39.8	022
2	1979	09	26.90729	20	46	03.61	+03	24	26.3	022
2	1979	09	27.81593	20	45	55.50	+03	13	40.3	022
2	1979	09	27.83394	20	45	55.29	+03	13	27.5	022
2	1979	09	27.83670	20	45	55.27	+03	13	24.7	022
2	1979	10	17.82848	20	47	12.70	-00	21	36.9	022
2	1979	10	17.83194	20	47	12.76	-00	21	38.8	022
2	1979	10	17.85134	20	47	13.04	-00	21	49.7	022
2	1979	11	07.78154	20	56	44.02	-03	09	11.4	022
2	1979	11	07.78600	20	56	44.11	-03	09	12.6	022

2	1979	11	07.79678	20	56	44.55	-03	09	16.3	022
2	1979	11	11.86897	20	59	25.66	-03	34	20.0	022
2	1979	11	11.87174	20	59	25.79	-03	34	21.0	022
2	1979	11	11.88074	20	59	26.10	-03	34	24.3	022
2	1979	11	19.82219	21	05	21.25	-04	16	21.4	022
2	1979	11	19.82634	21	05	21.45	-04	16	22.4	022
2	1979	11	19.83465	21	05	21.91	-04	16	24.8	022
3	1979	12	18.98781	07	41	44.11	+00	25	35.1	022
3	1979	12	18.98920	07	41	44.13	+00	25	35.9	022
3	1979	12	19.00098	07	41	43.69	+00	25	35.2	022
3	1980	01	02.95171	07	30	30.21	+00	56	04.2	022
3	1980	01	02.95379	07	30	30.10	+00	56	04.2	022
3	1980	01	02.95587	07	30	29.98	+00	56	04.8	022
3	1980	01	03.93167	07	29	38.96	+01	00	25.4	022
3	1980	01	03.93374	07	29	38.85	+01	00	26.1	022
3	1980	01	03.93582	07	29	38.72	+01	00	26.4	022
3	1980	01	07.93251	07	26	05.60	+01	21	06.2	022
3	1980	01	07.93460	07	26	05.51	+01	21	06.6	022
3	1980	01	07.95468	07	26	04.40	+01	21	13.6	022
3	1980	02	05.88588	07	04	33.50	+05	30	33.2	022
3	1980	02	05.88727	07	04	33.46	+05	30	34.2	022
3	1980	02	05.88866	07	04	33.43	+05	30	34.8	022
3	1980	02	24.84918	07	01	50.43	+08	40	48.6	022
3	1980	02	24.85057	07	01	50.45	+08	40	49.2	022
3	1980	02	24.85194	07	01	50.47	+08	40	50.1	022
3	1980	03	09.82972	07	06	49.60	+10	42	34.6	022
3	1980	03	09.83179	07	06	49.65	+10	42	35.1	022
3	1980	03	09.85050	07	06	50.27	+10	42	44.6	022
3	1980	03	16.83553	07	11	17.81	+11	34	32.4	022
3	1980	03	16.83762	07	11	17.86	+11	34	33.6	022
3	1980	03	16.85424	07	11	18.59	+11	34	40.3	022
3	1980	04	01.88898	07	25	39.63	+13	08	05.6	022
3	1980	04	01.89105	07	25	39.79	+13	08	06.1	022
3	1980	04	01.89314	07	25	39.92	+13	08	06.8	022
3	1980	04	07.83434	07	32	10.70	+13	33	33.3	022
3	1980	04	07.83850	07	32	10.96	+13	33	34.4	022
3	1980	04	07.84750	07	32	11.56	+13	33	36.1	022
3	1980	04	10.82465	07	35	39.55	+13	44	29.1	022
3	1980	04	10.82743	07	35	39.76	+13	44	30.1	022
3	1980	04	10.83229	07	35	40.15	+13	44	31.0	022
4	1979	10	17.94604	02	59	32.57	+05	57	25.5	022
4	1979	10	17.94882	02	59	32.47	+05	57	24.4	022
4	1979	10	17.96197	02	59	31.80	+05	57	20.8	022
4	1979	11	11.94688	02	35	21.56	+04	28	29.1	022
4	1979	11	11.94896	02	35	21.43	+04	28	27.8	022
4	1979	11	11.96211	02	35	20.60	+04	28	26.6	022
4	1979	11	25.84354	02	23	04.85	+04	12	19.3	022
4	1979	11	25.84632	02	23	04.68	+04	12	19.0	022
4	1979	11	25.87125	02	23	03.48	+04	12	19.8	022
4	1979	12	03.86024	02	17	46.68	+04	17	48.9	022
4	1979	12	03.86198	02	17	46.62	+04	17	48.9	022
4	1979	12	03.86372	02	17	46.56	+04	17	49.0	022
4	1979	12	06.84531	02	16	13.14	+04	22	38.4	022
4	1979	12	06.84740	02	16	13.09	+04	22	38.4	022
4	1979	12	06.84913	02	16	13.02	+04	22	38.7	022
4	1979	12	06.85104	02	16	12.98	+04	22	39.0	022
4	1979	12	12.82404	02	13	49.25	+04	36	40.7	022
4	1979	12	12.82612	02	13	49.18	+04	36	41.4	022
4	1979	12	12.85243	02	13	48.64	+04	36	45.5	022

4	1979	12	16.82629	02	12	46.19	+04	49	12.2	022
4	1979	12	16.83112	02	12	46.13	+04	49	13.8	022
4	1979	12	16.84706	02	12	45.89	+04	49	16.1	022
4	1979	12	18.89155	02	12	24.08	+04	56	34.9	022
4	1979	12	18.89363	02	12	24.08	+04	56	36.9	022
4	1979	12	18.91441	02	12	23.83	+04	56	41.2	022
4	1980	01	02.87969	02	13	14.96	+06	06	57.4	022
4	1980	01	02.88108	02	13	14.95	+06	06	57.7	022
4	1980	01	02.88245	02	13	14.98	+06	06	58.2	022
4	1980	01	06.86235	02	14	27.19	+06	29	52.0	022
4	1980	01	06.86409	02	14	27.26	+06	29	52.9	022
4	1980	01	06.88243	02	14	27.59	+06	29	59.3	022
4	1980	02	05.84295	02	34	30.64	+09	58	42.4	022
4	1980	02	05.84433	02	34	30.73	+09	58	43.2	022
4	1980	02	05.84572	02	34	30.79	+09	58	43.4	022
4	1980	02	07.84303	02	36	25.96	+10	14	03.4	022
4	1980	02	07.84441	02	36	26.04	+10	14	04.2	022
4	1980	02	07.84580	02	36	26.13	+10	14	04.7	022
4	1980	02	12.82590	02	41	29.20	+10	52	40.9	022
4	1980	02	12.82729	02	41	29.29	+10	52	41.9	022
4	1980	02	12.82867	02	41	29.34	+10	52	42.2	022
11	1980	02	07.98050	11	35	53.72	+06	53	05.7	022
11	1980	02	07.98258	11	35	53.65	+06	53	06.4	022
11	1980	02	07.98465	11	35	53.59	+06	53	07.1	022
11	1980	02	11.93460	11	33	50.84	+07	16	02.1	022
11	1980	02	11.93668	11	33	50.77	+07	16	02.6	022
11	1980	02	11.93806	11	33	50.71	+07	16	03.4	022
11	1980	03	09.87439	11	12	41.11	+10	22	42.1	022
11	1980	03	09.87854	11	12	40.87	+10	22	44.1	022
11	1980	03	09.88894	11	12	40.36	+10	22	48.7	022
11	1980	03	18.82142	11	04	47.27	+11	20	43.2	022
11	1980	03	18.83666	11	04	46.45	+11	20	49.4	022
11	1980	03	18.83942	11	04	46.30	+11	20	49.8	022
11	1980	03	30.86830	10	55	33.37	+12	21	50.5	022
11	1980	03	30.87037	10	55	33.29	+12	21	50.5	022
11	1980	03	30.87522	10	55	33.09	+12	21	52.1	022
11	1980	04	10.92102	10	49	34.60	+12	55	44.7	022
11	1980	04	10.92587	10	49	34.45	+12	55	45.4	022
11	1980	04	10.93072	10	49	34.31	+12	55	45.8	022
11	1980	04	22.84340	10	46	30.11	+13	07	02.5	022
11	1980	04	22.84688	10	46	30.08	+13	07	02.6	022
11	1980	04	22.85104	10	46	30.04	+13	07	02.5	022
11	1980	05	12.86181	10	49	24.72	+12	32	11.3	022
11	1980	05	12.86528	10	49	24.76	+12	32	10.6	022
11	1980	05	12.86806	10	49	24.82	+12	32	10.0	022
11	1980	06	04.87957	11	03	23.31	+10	45	33.6	022
11	1980	06	04.88995	11	03	23.82	+10	45	29.5	022
11	1980	06	04.89412	11	03	24.15	+10	45	28.9	022
18	1980	04	01.95616	13	47	40.77	+01	41	34.4	022
18	1980	04	01.95823	13	47	40.57	+01	41	35.0	022
18	1980	04	10.95091	13	39	51.44	+02	53	53.1	022
18	1980	04	10.95391	13	39	51.26	+02	53	54.8	022
18	1980	04	10.95807	13	39	51.01	+02	53	56.6	022
18	1980	04	22.86424	13	29	03.53	+04	16	41.2	022
18	1980	04	22.86771	13	29	03.33	+04	16	42.5	022
18	1980	04	22.87188	13	29	03.09	+04	16	44.1	022
18	1980	05	12.87847	13	13	50.31	+05	39	01.4	022
18	1980	05	12.88264	13	13	50.16	+05	39	02.4	022
18	1980	05	12.88565	13	13	50.05	+05	39	02.7	022

18	1980	06	04.89097	13	06	13.48	+05	33	01.8	022
18	1980	06	04.89375	13	06	13.46	+05	33	01.2	022
18	1980	06	04.89653	13	06	13.45	+05	33	00.7	022
18	1980	06	05.86300	13	06	10.42	+05	30	38.0	022
18	1980	06	05.87962	13	06	10.35	+05	30	36.8	022
18	1980	06	10.86596	13	06	15.22	+05	15	59.7	022
18	1980	06	10.88328	13	06	15.25	+05	15	56.8	022
31	1980	03	18.97847	14	22	05.82	-10	38	23.8	022
31	1980	03	18.98750	14	22	05.43	-10	38	24.7	022
31	1980	04	07.94480	14	05	54.01	-11	10	26.4	022
31	1980	04	07.96558	14	05	52.77	-11	10	28.4	022
31	1980	04	11.00720	14	02	57.02	-11	13	47.1	022
31	1980	04	11.01413	14	02	56.65	-11	13	47.7	022
31	1980	04	22.88231	13	51	06.45	-11	24	21.4	022
31	1980	04	22.88819	13	51	06.08	-11	24	22.0	022
31	1980	05	12.85546	13	32	51.07	-11	41	54.5	022
31	1980	05	12.88109	13	32	49.82	-11	41	56.2	022
31	1980	06	01.86734	13	20	54.55	-12	13	56.8	022
31	1980	06	01.88465	13	20	54.10	-12	13	59.1	022
31	1980	06	04.90346	13	19	48.70	-12	20	51.9	022
31	1980	06	04.92147	13	19	48.40	-12	20	54.9	022
39	1980	02	04.96929	08	54	59.20	+10	56	41.0	022
39	1980	02	04.97137	08	54	59.10	+10	56	41.8	022
39	1980	02	04.97830	08	54	58.69	+10	56	44.7	022
39	1980	02	12.90780	08	48	24.45	+11	49	57.8	022
39	1980	02	12.90919	08	48	24.38	+11	49	58.3	022
39	1980	02	12.91543	08	48	24.07	+11	50	00.9	022
39	1980	02	24.90014	08	39	45.48	+13	08	22.0	022
39	1980	02	24.90222	08	39	45.40	+13	08	22.8	022
39	1980	02	24.90638	08	39	45.27	+13	08	24.2	022
39	1980	03	18.92101	08	31	07.58	+15	09	15.3	022
39	1980	03	18.92448	08	31	07.55	+15	09	16.0	022
39	1980	03	18.92795	08	31	07.53	+15	09	17.0	022
39	1980	03	30.89045	08	31	36.64	+15	50	18.6	022
39	1980	03	30.89254	08	31	36.67	+15	50	18.9	022
39	1980	03	30.89738	08	31	36.71	+15	50	19.8	022
39	1980	04	07.85545	08	33	45.17	+16	08	49.6	022
39	1980	04	07.85891	08	33	45.21	+16	08	49.8	022
39	1980	04	07.88038	08	33	45.63	+16	08	51.9	022
39	1980	04	10.90313	08	34	55.69	+16	14	04.4	022
39	1980	04	10.90751	08	34	55.78	+16	14	05.0	022
39	1980	04	10.91064	08	34	55.86	+16	14	05.1	022
39	1980	05	12.84647	08	57	07.24	+16	12	16.4	022
39	1980	05	12.85000	08	57	07.43	+16	12	16.0	022
39	1980	05	12.85208	08	57	07.54	+16	12	15.7	022
51	1979	09	12.81498	20	11	41.39	-11	06	57.8	022
51	1979	09	12.83229	20	11	41.26	-11	07	04.2	022
51	1979	09	13.82021	20	11	36.38	-11	13	22.5	022
51	1979	09	13.83752	20	11	36.26	-11	13	29.5	022
51	1979	09	18.79582	20	11	36.97	-11	43	29.7	022
51	1979	09	18.81175	20	11	37.03	-11	43	35.4	022
51	1979	09	18.81521	20	11	37.02	-11	43	36.4	022
51	1979	09	26.83215	20	13	05.86	-12	25	54.8	022
51	1979	09	26.83561	20	13	05.99	-12	25	56.6	022
51	1979	09	26.84670	20	13	06.08	-12	25	58.5	022
51	1979	09	27.79134	20	13	23.69	-12	30	26.2	022
51	1979	09	27.80935	20	13	24.01	-12	30	31.4	022
51	1979	11	07.72925	20	45	12.07	-13	51	23.7	022
51	1979	11	07.74380	20	45	13.12	-13	51	23.6	022

51	1979	11	07.74726	20	45	13.33	-13	51	23.1	022
51	1979	11	11.84161	20	50	01.61	-13	47	42.8	022
51	1979	11	19.78444	20	59	56.85	-13	34	57.7	022
51	1979	11	19.79276	20	59	57.51	-13	34	56.9	022
76	1980	07	21.98117	21	26	12.91	-12	18	36.0	022
76	1980	07	21.99848	21	26	12.38	-12	18	38.6	022
143	1979	12	12.95145	06	41	11.51	+38	05	59.3	022
143	1979	12	12.97580	06	41	09.95	+38	06	01.1	022
143	1979	12	17.84027	06	36	03.37	+38	10	25.3	022
143	1979	12	17.86589	06	36	01.59	+38	10	26.1	022
143	1979	12	18.92098	06	34	51.98	+38	10	54.0	022
143	1979	12	18.94108	06	34	50.65	+38	10	55.0	022
148	1980	04	07.97666	16	26	28.02	+11	33	56.1	022
148	1980	04	07.99604	16	26	27.69	+11	34	06.3	022
148	1980	04	22.98958	16	20	51.86	+13	37	53.7	022
148	1980	04	22.99549	16	20	51.65	+13	37	56.4	022
148	1980	04	23.00174	16	20	51.49	+13	37	59.0	022
148	1980	06	04.90764	15	48	53.30	+16	01	30.8	022
148	1980	06	04.91389	15	48	53.03	+16	01	30.0	022
148	1980	06	15.91949	15	41	11.83	+15	27	12.9	022
148	1980	06	15.94373	15	41	10.82	+15	27	06.5	022
148	1980	07	03.91778	15	32	47.32	+13	37	07.5	022
148	1980	07	03.93716	15	32	46.95	+13	36	59.5	022
148	1980	09	01.81005	15	49	12.62	+03	59	28.5	022
153	1979	12	12.98515	06	34	56.37	+15	59	38.8	022
153	1979	12	13.00663	06	34	55.53	+15	59	37.3	022
153	1979	12	16.91744	06	32	28.79	+15	57	02.6	022
153	1979	12	16.94446	06	32	27.76	+15	57	01.6	022
153	1979	12	17.91542	06	31	50.41	+15	56	29.3	022
153	1979	12	17.93965	06	31	49.57	+15	56	30.8	022
153	1979	12	18.95076	06	31	10.17	+15	55	54.4	022
153	1979	12	18.97016	06	31	09.46	+15	55	53.1	022
480	1979	09	12.86485	20	14	58.93	+11	34	46.7	022
480	1979	09	12.88909	20	14	58.53	+11	34	33.9	022
480	1979	09	18.82282	20	14	03.52	+10	44	03.2	022
480	1979	09	18.84845	20	14	03.35	+10	43	49.6	022
480	1979	09	26.85362	20	14	17.88	+09	35	37.6	022
480	1979	09	26.87718	20	14	18.00	+09	35	25.4	022
480	1979	09	27.84329	20	14	26.68	+09	27	20.6	022
480	1979	11	07.75487	20	40	01.95	+05	04	49.6	022
480	1979	11	11.84784	20	44	19.24	+04	50	10.8	022
480	1979	11	11.86238	20	44	20.22	+04	50	07.8	022
480	1979	11	19.79968	20	53	20.09	+04	28	29.9	022
480	1979	11	19.81491	20	53	21.20	+04	28	27.9	022
488	1980	04	10.87743	12	45	07.27	+14	05	45.3	022
488	1980	04	10.89618	12	45	06.36	+14	05	46.7	022
536	1979	12	12.95145	06	46	05.84	+38	26	09.7	022
536	1979	12	12.97580	06	46	04.54	+38	26	18.6	022
536	1979	12	17.84027	06	41	46.72	+38	53	20.3	022
536	1979	12	17.86589	06	41	45.26	+38	53	29.2	022
536	1979	12	18.92098	06	40	46.62	+38	59	00.9	022
536	1979	12	18.94108	06	40	45.49	+38	59	06.2	022
536	1980	01	07.90412	06	21	11.52	+40	14	21.3	022
536	1980	01	07.92490	06	21	10.33	+40	14	22.8	022
568	1979	10	17.89324	02	41	27.50	+32	23	03.9	022
568	1979	10	17.91332	02	41	26.57	+32	22	56.7	022
568	1979	11	11.91571	02	21	34.58	+28	07	04.6	022
568	1979	11	11.94133	02	21	33.34	+28	06	44.8	022
568	1979	11	19.90287	02	15	54.37	+26	21	55.6	022

568	1979	11	19.92295	02	15	53.50	+26	21	39.0	022
568	1979	11	25.87748	02	12	30.52	+25	01	59.3	022
568	1979	11	25.90034	02	12	29.80	+25	01	40.2	022
568	1979	12	12.85807	02	08	04.47	+21	32	06.3	022
568	1979	12	16.88455	02	08	14.88	+20	49	17.7	022
568	1979	12	16.90809	02	08	14.96	+20	49	03.0	022
568	1979	12	17.81188	02	08	21.48	+20	39	55.3	022
568	1979	12	17.83196	02	08	21.50	+20	39	43.2	022
568	1979	12	18.86247	02	08	30.52	+20	29	29.5	022
568	1979	12	18.88601	02	08	30.68	+20	29	15.9	022
909	1980	04	10.87743	12	50	49.65	+13	36	21.2	022
909	1980	04	10.89618	12	50	48.96	+13	36	26.0	022
909	1980	04	22.94826	12	43	55.21	+14	26	25.1	022
909	1980	04	22.95868	12	43	54.83	+14	26	26.8	022
909	1980	05	10.89174	12	36	20.26	+14	57	38.2	022
909	1980	05	10.90351	12	36	20.04	+14	57	38.6	022
1022	1980	05	12.92784	15	01	05.29	+17	30	50.8	022
1022	1980	06	01.90993	14	46	02.15	+15	16	19.3	022
1022	1980	06	01.92240	14	46	01.66	+15	16	12.8	022
1022	1980	06	02.93074	14	45	27.80	+15	06	00.6	022
1022	1980	06	02.94806	14	45	27.32	+15	05	48.5	022
1022	1980	06	03.89859	14	44	56.90	+14	55	56.0	022
1022	1980	06	03.91486	14	44	56.38	+14	55	46.5	022
1036	1980	04	22.92778	13	51	20.06	-14	41	51.3	022
1036	1980	04	22.93715	13	51	19.53	-14	41	45.3	022
1036	1980	05	10.91944	13	34	45.84	-11	16	54.0	022
1036	1980	05	10.92775	13	34	45.41	-11	16	48.4	022
1093	1980	04	10.84132	13	14	54.09	+18	49	11.5	022
1093	1980	04	10.86910	13	14	52.55	+18	49	11.8	022
1093	1980	04	22.96493	13	03	49.12	+18	39	57.3	022
1093	1980	04	22.97326	13	03	48.69	+18	39	56.3	022
1093	1980	05	10.87892	12	50	13.12	+17	30	06.0	022
1093	1980	05	10.88308	12	50	12.95	+17	30	04.4	022
1149	1979	11	11.91571	02	18	28.48	+26	00	45.2	022
1149	1979	11	11.94133	02	18	27.18	+26	00	32.5	022
1149	1979	11	19.90287	02	12	35.91	+24	50	49.3	022
1149	1979	11	19.92295	02	12	35.15	+24	50	38.7	022
1149	1979	11	25.87748	02	08	59.59	+23	58	02.6	022
1149	1979	11	25.90034	02	08	58.86	+23	57	50.4	022

OBSERVATIONS MADE AT SONNEBERG (CODE 031) BY BRANDT, FRIEDEMANN AND GOTZ  
AND AT POTSDAM (CODE 042) BY GUNTZEL-LINGNER AND WEMPE. MEASURED BY  
C. HOFFMEISTER. REDUCED BY J. SCHUBART. FROM ASTRON. NACHR. 285, 277.  
ALL THE SONNEBERG OBSERVATIONS ON MPC 1636 SHOULD BE IGNORED.

Object	Date	UT	R. A. (1950)			Decl.			Obs.	
1627	1957	07	16.89757	22	20	31.45	+05	47	01.8	031
1627	1957	07	16.90938	22	20	35.00	+05	46	38.2	031
1627	1957	07	25.06163	23	00	33.63	+00	31	00.5	042
1627	1957	07	26.06062	23	05	04.25	-00	10	35.9	042
1627	1957	07	28.07382	23	13	50.36	-01	35	20.4	042
1627	1957	07	31.92743	23	29	22.86	-04	18	14.5	031
1627	1957	08	01.00104	23	29	38.62	-04	21	22.0	031
1627	1957	08	01.01632	23	29	41.93	-04	22	00.5	031
1627	1957	08	01.02285	23	29	43.30	-04	22	15.6	042
1627	1957	08	05.02812	23	43	53.87	-07	08	21.3	031
1627	1957	08	05.04201	23	43	56.38	-07	08	55.3	031
1627	1957	08	06.01111	23	47	04.46	-07	48	04.7	031
1627	1957	08	06.02604	23	47	06.95	-07	48	39.8	031
1627	1957	08	06.04062	23	47	09.61	-07	49	13.9	031



1627	1957	08	06.04804	23	47	10.92	-07	49	36.3	042
1627	1957	08	22.98750	00	23	22.49	-17	29	48.9	031
1627	1957	08	23.00556	00	23	23.69	-17	30	19.6	031
1627	1957	08	23.02118	00	23	24.48	-17	30	43.8	031
1627	1957	08	23.04201	00	23	25.68	-17	31	18.8	031
1627	1957	08	24.98958	00	25	31.70	-18	22	50.6	031
1627	1957	08	25.00694	00	25	32.51	-18	23	15.2	031
1627	1957	08	29.03056	00	28	44.34	-19	58	40.4	031
1627	1957	08	29.04792	00	28	44.89	-19	59	03.3	031
1627	1957	08	30.01770	00	29	19.10	-20	19	49.1	042
1627	1957	08	30.05786	00	29	19.96	-20	20	40.4	042
1627	1957	09	03.99262	00	31	09.42	-21	52	28.2	042
1627	1957	09	04.00556	00	31	09.45	-21	52	42.2	031
1627	1957	09	04.01755	00	31	09.48	-21	52	52.8	042
1627	1957	09	04.02806	00	31	09.43	-21	53	04.6	042
1627	1957	09	04.02986	00	31	09.46	-21	53	05.2	031
1627	1957	09	05.02747	00	31	19.90	-22	08	53.9	042
1627	1957	09	05.03611	00	31	19.96	-22	08	58.3	031
1627	1957	09	05.05972	00	31	19.78	-22	09	22.9	031
1627	1957	09	07.99353	00	31	31.79	-22	50	37.6	042
1627	1957	09	26.90347	00	26	13.92	-24	24	49.6	031
1627	1957	09	26.96042	00	26	12.10	-24	24	43.8	031
1627	1957	09	26.98472	00	26	11.35	-24	24	40.2	031
1627	1957	09	29.97622	00	25	05.74	-24	15	24.4	031
1627	1957	09	30.00469	00	25	04.96	-24	15	18.0	031
1627	1957	09	30.91771	00	24	46.71	-24	11	21.3	031
1627	1957	09	30.94792	00	24	45.70	-24	11	11.3	031
1627	1957	10	01.95035	00	24	26.03	-24	06	19.3	031
1627	1957	10	01.97396	00	24	25.40	-24	06	13.2	031
1627	1957	10	25.83333	00	23	01.24	-20	03	50.1	031
1627	1957	10	25.89583	00	23	01.78	-20	03	06.8	031
1627	1957	11	20.95694	00	37	54.11	-13	26	15.6	031
1627	1957	11	21.77639	00	38	36.67	-13	13	07.7	031
1627	1957	11	21.80868	00	38	38.30	-13	12	37.5	031

OBSERVATIONS MADE AT TAUTENBURG BY F. BORNGEN, R. ZIENER AND K. KIRSCH.  
COMMUNICATED BY S. MARX.

Object	Date	UT	R. A. (1950)			Decl.	Mag.	Obs.
1980 TT *	1980	10	03.85833	23	13	38.79	+15 50 20.6	14.4R 033
1980 TT	1980	10	03.94167	23	13	35.48	+15 49 49.5	033
1980 TU *	1980	10	03.85833	23	14	38.40	+17 10 16.1	15.0R 033
1980 TU	1980	10	03.94167	23	14	35.54	+17 09 37.9	033
1980 TV *	1980	10	03.85833	23	15	51.57	+16 56 39.8	16.2R 033
1980 TV	1980	10	03.94167	23	15	48.63	+16 56 02.2	033
1980 TW *	1980	10	03.85833	23	17	07.01	+18 03 47.5	15.2R 033
1980 TW	1980	10	03.94167	23	17	04.05	+18 03 17.6	033
1980 TX *	1980	10	03.85833	23	19	50.85	+16 17 28.9	12.9R 033
1980 TX	1980	10	03.94167	23	19	48.51	+16 16 20.3	033
1980 TY *	1980	10	10.87326	01	29	51.86	+29 47 12.5	18.0 033
1980 TY	1980	10	10.88785	01	29	50.98	+29 47 14.3	033
1980 TZ *	1980	10	10.87326	01	34	07.49	+29 03 28.0	18.7 033
1980 TZ	1980	10	10.88785	01	34	06.77	+29 03 25.9	033

OBSERVATIONS MADE AT KLET BY A. MRKOS, Z. VAVROVA AND L. BROZEK.

Object	Date	UT	R. A. (1950)			Decl.	Mag.	N	Obs.
1788	1980	10	03.97054	01	47	04.22	+10 20 48.9		046
1788	1980	10	03.98472	01	47	03.67	+10 20 48.3		046
1788	1980	10	05.96464	01	45	37.86	+10 12 15.6		046
1788	1980	10	05.97882	01	45	37.23	+10 12 10.6		046

1973		1980	10	01.89397	01	07	36.92	+03	52	45.0		046
1973		1980	10	03.89138	01	06	17.61	+03	36	46.1		046
1973		1980	10	03.90561	01	06	17.11	+03	36	40.6		046
1973		1980	10	05.90469	01	04	56.56	+03	20	43.3		046
1973		1980	10	05.91887	01	04	55.96	+03	20	36.1		046
2052		1980	09	29.82643	00	02	23.36	+08	06	20.2		046
2052		1980	09	29.83928	00	02	22.79	+08	06	13.5		046
2176		1980	10	01.84796	00	16	01.99	-03	16	43.4	17.8	046
2176		1980	10	01.86567	00	16	01.28	-03	16	47.9		046
2176		1980	10	03.85596	00	14	29.56	-03	25	51.7		046
2176		1980	10	03.87020	00	14	29.09	-03	25	56.5		046
2176		1980	10	05.86672	00	12	58.13	-03	34	40.0		046
2176		1980	10	05.88096	00	12	57.67	-03	34	41.4		046
1979	KB	1980	10	03.97054	01	48	23.17	+08	43	02.1	17.4	046
1979	KB	1980	10	03.98472	01	48	22.46	+08	42	54.6		046
1980	PP	1980	09	02.81602	20	39	37.47	-09	09	48.2	17.6	046
1980	PP	1980	09	02.83020	20	39	37.09	-09	09	50.2		046
1980	PP	1980	09	03.82791	20	39	05.87	-09	12	08.5		046
1980	PP	1980	09	03.84214	20	39	05.31	-09	12	11.0		046
1980	RX1	1980	10	01.86567	00	20	35.59	-04	32	22.6		046
1980	RX1	1980	10	02.98951	00	19	38.93	-04	41	14.6		046
1980	RX1	1980	10	03.00132	00	19	38.30	-04	41	21.2		046
1980	SD	1980	10	01.84796	00	18	36.09	-03	48	05.5	17.5	046
1980	SD	1980	10	01.86567	00	18	35.13	-03	48	03.7		046
1980	SD	1980	10	02.98951	00	17	23.29	-03	47	25.3		046
1980	SD	1980	10	03.00132	00	17	22.59	-03	47	25.2		046
1980	SD	1980	10	03.85596	00	16	28.87	-03	46	52.0		046
1980	SD	1980	10	03.87020	00	16	27.88	-03	46	51.5		046
1980	SD	1980	10	05.86672	00	14	23.66	-03	45	11.9		046
1980	SD	1980	10	05.88096	00	14	22.87	-03	45	12.0		046
1980	SF	1980	10	03.89138	01	03	13.05	+03	20	10.8	17.5	046
1980	SF	1980	10	03.90561	01	03	12.20	+03	20	04.4		046
1980	SF	1980	10	05.90469	01	01	40.86	+03	06	24.4		046
1980	SF	1980	10	05.91887	01	01	40.12	+03	06	19.8		046
1980	SG	1980	10	01.89397	01	05	04.51	+04	37	56.3		046
1980	SG	1980	10	01.90728	01	05	03.53	+04	37	55.1		046
1980	SG	1980	10	03.89138	01	03	05.42	+04	36	24.5		046
1980	SG	1980	10	03.90561	01	03	04.66	+04	36	23.6		046
1980	SG	1980	10	05.90469	01	01	03.76	+04	34	46.3		046
1980	SG	1980	10	05.91887	01	01	02.95	+04	34	45.1		046
1980	SH	1980	10	03.93304	01	09	34.76	-04	48	18.5	1	046
1980	SH	1980	10	03.94728	01	09	34.03	-04	48	51.0	1	046
1980	SH	1980	10	05.93686	01	08	06.66	-05	46	10.3		046
1980	SH	1980	10	05.94624	01	08	06.21	-05	46	24.5		046
1980	SJ	* 1980	09	29.82643	23	52	59.16	+07	28	12.5	17.0	046
1980	SJ	1980	09	29.83928	23	52	58.53	+07	28	03.9		046
1980	SJ	1980	10	01.81006	23	51	27.11	+07	11	48.1		046
1980	SJ	1980	10	01.82487	23	51	26.37	+07	11	39.4		046
1980	SJ	1980	10	03.82083	23	49	56.52	+06	54	58.8		046
1980	SJ	1980	10	03.83501	23	49	55.92	+06	54	56.1		046
1980	SK	* 1980	09	29.82643	23	53	20.13	+07	26	38.3	16.8	046
1980	SK	1980	09	29.83928	23	53	19.22	+07	26	41.4		046
1980	SK	1980	10	01.81006	23	51	18.66	+07	30	16.3		046
1980	SK	1980	10	01.82487	23	51	17.70	+07	30	16.7		046
1980	SK	1980	10	03.82083	23	49	19.43	+07	33	32.3		046
1980	SK	1980	10	03.83501	23	49	18.69	+07	33	34.5		046
1980	SL	* 1980	09	29.82643	23	55	36.69	+05	10	29.7	18.0	046
1980	SL	1980	09	29.83928	23	55	35.83	+05	10	24.1		046
1980	SL	1980	10	01.81006	23	54	15.85	+04	54	54.9		046

1980	SL		1980	10	01.82487	23	54	15.20	+04	54	52.5		046
1980	SM	*	1980	09	29.82643	23	57	05.27	+07	24	04.0	17.0	046
1980	SM		1980	09	29.83928	23	57	04.50	+07	24	02.8		046
1980	SM		1980	10	01.81006	23	55	12.13	+07	23	08.0		046
1980	SM		1980	10	01.82487	23	55	11.23	+07	23	07.5		046
1980	SM		1980	10	03.82083	23	53	19.73	+07	21	56.5		046
1980	SM		1980	10	03.83501	23	53	18.92	+07	21	54.8		046
1980	SN	*	1980	09	29.82643	23	57	53.34	+05	47	53.4	18.0	046
1980	SN		1980	09	29.83928	23	57	52.79	+05	47	58.3		046
1980	SN		1980	10	01.81006	23	55	47.14	+05	54	50.8		046
1980	SN		1980	10	01.82487	23	55	46.96	+05	54	53.8		046
1980	SO	*	1980	09	29.82643	23	59	32.19	+05	56	03.6	15.4	046
1980	SO		1980	09	29.83928	23	59	31.23	+05	56	05.6		046
1980	SO		1980	10	01.81006	23	57	15.77	+06	00	48.8		046
1980	SO		1980	10	01.82487	23	57	14.83	+06	00	50.3		046
1980	SO		1980	10	03.82083	23	55	00.61	+06	05	22.9		046
1980	SO		1980	10	03.83501	23	54	59.67	+06	05	25.2		046
1980	SP	*	1980	09	29.82643	00	00	02.16	+08	12	01.5	16.4	046
1980	SP		1980	09	29.83928	00	00	01.38	+08	11	57.1		046
1980	SP		1980	10	01.81006	23	58	09.32	+08	00	55.8		046
1980	SP		1980	10	01.82487	23	58	08.43	+08	00	50.7		046
1980	SP		1980	10	03.82083	23	56	16.93	+07	49	24.4		046
1980	SP		1980	10	03.83501	23	56	16.15	+07	49	19.6		046
1980	SQ	*	1980	09	29.82643	00	02	08.59	+06	51	57.4	16.8	046
1980	SQ		1980	09	29.83928	00	02	07.79	+06	51	50.3		046
1980	SQ		1980	10	01.81006	00	00	31.41	+06	33	58.6		046
1980	SQ		1980	10	01.82487	00	00	30.54	+06	33	52.1		046
1980	SQ		1980	10	03.82083	23	58	55.11	+06	15	35.7		046
1980	SQ		1980	10	03.83501	23	58	54.50	+06	15	27.9		046
1980	TE	*	1980	10	01.89397	01	06	19.53	+02	52	38.1	17.0	046
1980	TE		1980	10	01.90728	01	06	18.82	+02	52	35.0		046
1980	TE		1980	10	03.89138	01	04	50.96	+02	43	06.2		046
1980	TE		1980	10	03.90561	01	04	50.36	+02	43	01.2		046
1980	TF	*	1980	10	02.98951	00	07	53.61	-01	58	03.5	17.4	046
1980	TF		1980	10	03.00132	00	07	53.00	-01	58	04.8		046
1980	TF		1980	10	03.85596	00	07	17.66	-02	02	06.7		046
1980	TF		1980	10	03.87020	00	07	16.82	-02	02	11.3		046
1980	TF		1980	10	05.86672	00	05	53.82	-02	11	25.9		046
1980	TF		1980	10	05.88096	00	05	53.31	-02	11	29.2		046
1980	TG	*	1980	10	02.98951	00	10	22.56	-02	32	31.3	17.9	046
1980	TG		1980	10	03.00132	00	10	22.07	-02	32	38.3		046
1980	TG		1980	10	03.85596	00	09	38.59	-02	37	52.9		046
1980	TG		1980	10	03.87020	00	09	37.75	-02	37	58.5		046
1980	TG		1980	10	05.86672	00	07	58.00	-02	49	43.4		046
1980	TG		1980	10	05.88096	00	07	57.09	-02	49	48.8		046
1980	TH	*	1980	10	03.82083	23	54	18.44	+07	31	03.2	17.5	046
1980	TH		1980	10	03.83501	23	54	17.50	+07	31	00.6		046
1980	TJ	*	1980	10	03.82083	23	57	10.89	+07	58	37.1	18.0	046
1980	TJ		1980	10	03.83501	23	57	10.39	+07	58	36.3		046
1980	TK	*	1980	10	03.85596	00	17	09.51	-03	14	53.4	17.2	046
1980	TK		1980	10	03.87020	00	17	08.93	-03	15	01.2		046
1980	TK		1980	10	05.86672	00	15	59.64	-03	35	38.9		046
1980	TK		1980	10	05.88096	00	15	59.17	-03	35	48.0		046
1980	TL	*	1980	10	03.89138	01	04	41.51	+03	14	58.9	17.2	046
1980	TL		1980	10	03.90561	01	04	40.97	+03	14	55.3		046
1980	TL		1980	10	05.90469	01	03	13.80	+03	04	33.5		046
1980	TL		1980	10	05.91887	01	03	13.29	+03	04	30.5		046
1980	TM	*	1980	10	03.97054	01	45	33.94	+10	36	29.0	16.8	046
1980	TM		1980	10	03.98472	01	45	33.12	+10	36	30.0		046

1980 TM	1980 10 05.96464	01 43 57.19	+10 31 19.7		046
1980 TM	1980 10 05.97882	01 43 56.17	+10 31 17.1		046
1980 TN *	1980 10 03.97054	01 50 33.89	+07 18 34.4	17.0	046
1980 TN	1980 10 03.98472	01 50 33.11	+07 18 30.5		046
1980 TN	1980 10 05.96464	01 49 05.38	+07 10 53.0		046
1980 TN	1980 10 05.97882	01 49 04.55	+07 10 49.5		046
1980 TO *	1980 10 03.97054	01 51 00.31	+09 37 48.1	16.6	046
1980 TO	1980 10 03.98472	01 50 59.56	+09 37 39.8		046
1980 TO	1980 10 05.96464	01 49 23.05	+09 23 00.8		046
1980 TO	1980 10 05.97882	01 49 23.13	+09 22 55.0		046
1980 TP *	1980 10 03.97054	01 51 35.77	+08 54 16.4		046
1980 TP	1980 10 03.98472	01 51 35.08	+08 54 12.3		046
1980 TP	1980 10 05.96464	01 50 03.33	+08 42 11.6		046
1980 TP	1980 10 05.97882	01 50 02.56	+08 42 06.3		046
1980 TQ *	1980 10 03.97054	01 54 26.45	+09 16 03.3	17.0	046
1980 TQ	1980 10 03.98472	01 54 26.08	+09 15 57.8		046
1980 TQ	1980 10 05.96464	01 53 09.36	+09 00 56.9		046
1980 TQ	1980 10 05.97882	01 53 08.89	+09 00 52.1		046
1980 TR *	1980 10 05.90469	01 03 48.14	+02 43 46.8	17.0	046
1980 TR	1980 10 05.91887	01 03 47.34	+02 43 42.3		046
1980 TS *	1980 10 05.96464	01 55 14.21	+09 11 38.9	17.0	046
1980 TS	1980 10 05.97882	01 55 13.58	+09 11 37.8		046

Note 1: long trails, interrupted by clouds.

OBSERVATIONS MADE AT TURKU BY Y. VAISALA, L. OTERMA AND H. A. ALIKOSKI.  
MEASURED BY M.-O. SNARE.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
131	1946 09 25.95009	01 00 44.51	-00 49 25.7		062
131	1946 09 25.98458	01 00 42.68	-00 49 36.0		062
131	1946 10 03.94295	00 53 22.50	-01 28 33.9		062
131	1946 10 07.00356	00 50 28.90	-01 42 40.0		062
232	1946 09 25.95009	01 10 24.76	+01 15 13.0		062
232	1946 09 25.98458	01 10 23.24	+01 14 58.2		062
232	1946 10 03.94295	01 04 00.72	+00 21 23.5		062
232	1946 10 07.00356	01 01 27.88	+00 01 05.4		062
435	1948 10 27.90454	01 26 34.25	+09 26 52.5		062
435	1948 10 27.94794	01 26 32.04	+09 26 41.4		062
499	1948 10 27.90454	01 29 14.45	+11 46 03.0		062
499	1948 10 27.94794	01 29 12.82	+11 45 51.7		062
669	1943 04 06.85618	11 54 31.47	+04 11 05.3		062
669	1943 04 06.89391	11 54 30.05	+04 11 19.6		062
669	1943 04 07.90198	11 53 52.45	+04 18 10.6		062
905	1943 04 06.85618	11 56 47.83	+05 24 16.8		062
905	1943 04 06.89391	11 56 45.69	+05 24 22.9		062
905	1943 04 07.90198	11 55 50.19	+05 27 40.8		062
1010	1950 03 07.83345	08 11 10.60	+23 04 23.2		062
1010	1950 03 07.86551	08 11 10.25	+23 04 22.0		062
1128	1943 04 06.85618	11 40 27.31	+03 32 03.6		062
1128	1943 04 06.89391	11 40 25.66	+03 32 11.9		062
1225	1948 10 27.90454	01 21 29.58	+10 11 37.5		062
1225	1948 10 27.94794	01 21 26.90	+10 11 25.7		062
1576	1948 10 27.90454	01 22 32.56	+07 40 15.6		062
1576	1948 10 27.94794	01 22 30.53	+07 40 04.1		062
1943 DH	1943 02 26.91012	09 41 46.55	+21 07 12.0		062
1943 DH	1943 03 01.91572	09 39 54.06	+21 14 31.2		062
1943 DH	1943 03 11.85259	09 34 23.44	+21 32 32.9		062
1943 GV	1943 04 06.85618	11 48 25.22	+02 49 30.8		062
1943 GV	1943 04 06.89391	11 48 22.99	+02 49 25.8		062
1943 GV	1943 04 07.90198	11 47 25.87	+02 47 39.1		062

1946 SE	1946 09 25.95009	01 01 31.17	-00 04 15.7	062
1946 SE	1946 09 25.98458	01 01 29.46	-00 04 19.8	062
1946 SE	1946 10 03.94295	00 54 36.65	-00 17 15.7	062
1946 SE	1946 10 07.00356	00 51 52.56	-00 21 39.6	062

OBSERVATIONS MADE AT TRAUNSTEIN BY R. BENDEL. REDUCED BY R. HEMPEL. COMMUNICATED BY F. FREVERT.

Object	Date	UT	R. A. (1950)	Decl.	O - C	Obs.
148	1980 06 12.94861	15 43 06.92	+15 39 15.1	0.0	0	065
148	1980 06 12.95417	15 43 06.70	+15 39 14.0	0.0	0	065
148	1980 06 12.95972	15 43 06.50	+15 39 12.7	0.0	0	065
148	1980 06 12.97083	15 43 06.01	+15 39 10.7	0.0	0	065
148	1980 06 13.91111	15 42 28.76	+15 35 34.2	0.0	0	065
148	1980 06 13.91944	15 42 28.48	+15 35 31.6	0.0	0	065
148	1980 06 13.93125	15 42 27.95	+15 35 28.7	0.0	0	065
148	1980 06 13.93681	15 42 27.74	+15 35 27.9	0.0	0	065

OBSERVATIONS MADE AT THE CRIMEAN ASTROPHYSICAL OBSERVATORY BY N. S. CHERNYKH. FROM KIEV KOMET. TSIRK. NO. 266.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1980k	1980 08 21.77685	13 36 41.73	+29 26 50.1	11 T	095	
/1980k	1980 08 21.79352	13 36 45.82	+29 26 38.6		095	

OBSERVATIONS MADE AT GISSAR BY S. I. GERASIMENKO, H. P. MARCHENKO AND F. A. TUPIEVA. FROM KIEV KOMET. TSIRK. NO. 265.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1977 XIV	1977 09 09.65666	15 32 52.23	+27 52 50.2	10.5T	190	
/1977 XIV	1977 09 11.68750	15 36 51.16	+27 12 37.6	10 T	190	
/1977 XIV	1977 09 12.65337	15 38 49.27	+26 52 57.6	10 T	190	
/1977 XIV	1977 09 13.65336	15 40 53.13	+26 32 28.0	9.5T	190	
/1977 XIV	1977 09 14.64409	15 42 58.88	+26 11 44.5	9.5T	190	
/1977 XIV	1977 09 15.63372	15 45 07.18	+25 50 41.7	10 T	190	
/1977 XIV	1977 10 06.61450	16 41 31.30	+16 40 42.7	7 T	190	
/1977 XIV	1977 10 14.64716	17 09 22.25	+11 58 57.2	7 T	190	
/1977 XIV	1977 10 15.63977	17 13 04.71	+11 20 46.9		190	
/1977 XIV	1977 10 16.66635	17 16 57.96	+10 40 10.9		190	

OBSERVATIONS MADE AT GEISEI BY T. SEKI. MAINLY FROM ORIENT. ASTRON. ASSOC. COMET BULL. NOS. 201-204 AND NIHONDAIRA OBS. CIRC. NOS. 1151 AND 1152.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1977 XI	1980 09 12.79306	03 34 42.2	+34 54 49	16 T	372	
/1977 XI	1980 10 04.76719	04 41 47	+47 21.8	14 T	372	
/1977 XI	1980 10 08.71632	05 06 48	+50 53.0	10.5T	372	
/1977 XI	1980 10 21.78333	08 40 27	+60 53.1	9 T	372	
/1980e	1980 07 19.63750	18 03 00.89	-17 26 32.5	16 T	372	
/1980e	1980 07 19.64861	18 02 59.86	-17 26 16.1		372	
/1980g	1980 09 12.77917	04 04 35.18	-00 18 43.6	13.5T	372	
/1980h	1980 10 04.74792	08 42 30.6	+61 32 47	14.5T	372	
/1980h	1980 10 08.73090	08 55 51.4	+59 46 28		372	
1974 OS	1980 09 30.57882	01 14 28.82	+22 10 39.4	16	372	
1974 OS	1980 10 01.53247	01 13 44.07	+22 08 49.4		372	
1974 OS	1980 10 02.56042	01 12 55.00	+22 06 32.6	16	372	
1974 OS	1980 10 02.57361	01 12 54.27	+22 06 31.1		372	
1974 SU4	1980 10 14.72187	05 07 58.26	+19 45 19.1	17	372	
1974 SU4	1980 10 14.76910	05 07 58.63	+19 45 18.8		372	
1974 SU4	1980 10 15.70347	05 08 04.55	+19 44 53.8	17	372	
1980 VB *	1980 11 14.61250	02 04 54.37	+00 00 48.8	15	372	
1980 VB	1980 11 14.62813	02 04 53.61	+00 00 53.7		372	

## OBSERVATIONS MADE AT YATSUGATAKE OBSERVATORY BY T. URATA.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
1862	1980 11 15.38992		21 39 42.55	+16 14 05.2	13	1	386
1862	1980 11 15.39094		21 39 44.94	+16 14 19.9		1	386

Note 1: observatory code 386, Long. and Parallax 138.32, -346, -249 (see MPC 4766).

## OBSERVATIONS MADE AT THE JCPM HAMATONBETSU STATION BY M. TAKEISHI. FROM HAMATONBETSU STA. REP. NO. 2.

Object	Date	UT	R. A. (1950)	Decl.	Mag.		Obs.
/1980g	1980 09 20.68958		04 17 46.86	+00 19 35.9	13	T	394
/1980g	1980 09 20.71076		04 17 48.61	+00 19 45.0			394
/1980q	1980 11 10.41597		18 02 34.01	+39 33 02.0	10	T	394
/1980q	1980 11 10.43333		18 02 33.07	+39 32 22.0			394
407	1980 10 11.46736		01 09 16.97	+21 02 04.2	13		394
407	1980 10 11.48264		01 09 16.11	+21 02 00.2			394
407	1980 10 12.51667		01 08 19.14	+20 57 04.5	13		394
407	1980 10 12.53264		01 08 18.25	+20 57 00.9			394
506	1980 09 08.55000		22 48 32.32	+07 28 43.3	14		394
506	1980 09 08.56667		22 48 31.56	+07 28 41.2			394
925	1980 09 04.56528		23 09 28.56	+22 27 52.9	13		394
925	1980 09 04.58889		23 09 26.95	+22 27 54.3			394
925	1980 09 06.53681		23 07 31.58	+22 28 52.7			394
925	1980 09 08.50625		23 05 33.53	+22 28 44.1			394
925	1980 09 08.52153		23 05 32.91	+22 28 48.3			394
1974 OS	1980 10 11.46736		01 05 31.43	+21 39 25.7	16		394
1974 OS	1980 10 11.48264		01 05 30.67	+21 39 23.5			394
1974 OS	1980 10 12.53264		01 04 37.18	+21 35 18.8	16		394
1974 OS	1980 10 12.54375		01 04 36.41	+21 35 16.7			394

## OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT TELESCOPE AT COONABARABRAN BY K. S. RUSSELL, A. SAVAGE, M. HARTLEY AND J. BARROW.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1979d	1979 02 27.71042		13 10 16.71	-38 19 44.4		1	413
/1979e	1978 08 23.50847		19 32 02.25	-57 55 45.3		1	413
/1979e	1978 08 26.47670		19 28 05.60	-57 24 46.7		1	413
/1979e	1979 08 15.47039		18 53 54.68	-05 20 11.2			413
/19801	1980 09 15.77998		03 03 10.68	-40 53 25.4			413
/19801	1980 09 16.74791		03 01 44.44	-41 31 45.4			413
/19801	1980 09 19.77293		02 56 46.16	-43 32 44.6			413
/19801	1980 10 01.63321		02 29 10.74	-51 20 44.7			413
/1980o	1980 08 09.62245		22 11 51.86	-35 07 58.4	16	T	413
/1980o	1980 09 28.42852		21 44 40.86	-32 07 17.2	17	T	413
/1980o	1980 10 03.40961		21 45 08.09	-31 20 33.3			413
/1980o	1980 10 06.43113		21 45 44.37	-30 50 49.6			413
/1980o	1980 10 02.41597		21 44 59.51	-31 30 05.6			413

Note 1: previously unpublished prediscovery observations.

## OBSERVATIONS MADE AT KAMBAH BY D. HERALD.

Object	Date	UT	R. A. (1950)	Decl.		Obs.
/1980g	1980 10 28.52153		05 10 46.76	+06 00 15.5		415
/1980g	1980 11 03.54711		05 16 41.82	+07 41 13.2		415
8	1980 07 09.42986		16 12 07.84	-16 32 42.4		415
8	1980 07 12.46111		16 10 52.02	-16 39 59.3		415
14	1980 06 16.52222		15 00 45.62	-10 45 04.1		415
14	1980 06 17.50694		15 00 25.39	-10 49 42.6		415
125	1980 06 17.50694		14 51 23.32	-09 38 03.5		415
131	1980 10 28.47291		23 35 18.10	-09 25 32.2		415
131	1980 10 29.47361		23 34 59.20	-09 24 16.8		415

145	1980 07 05.60104	17 41 18.92	-28 07 54.5	415
168	1980 07 09.42986	16 20 39.45	-16 43 04.6	415
168	1980 07 12.46111	16 19 39.64	-16 41 54.9	415
196	1980 10 28.47291	23 42 16.23	-11 50 54.2	415
196	1980 10 29.47361	23 41 56.65	-11 49 37.6	415
201	1980 10 28.47291	23 44 12.36	-07 16 47.3	415
201	1980 10 29.47361	23 44 06.92	-07 18 06.7	415
250	1980 10 28.47291	23 32 30.35	-10 01 29.2	415
250	1980 10 29.47361	23 32 07.08	-09 58 52.5	415
374	1980 07 09.42986	16 15 42.38	-12 20 51.0	415
374	1980 07 12.46111	16 15 06.91	-12 19 31.4	415
412	1980 07 09.42986	16 05 32.91	-10 57 19.2	415
412	1980 07 12.46111	16 04 45.13	-11 16 08.3	415
487	1980 07 09.42986	16 05 08.50	-11 44 41.3	415
487	1980 07 12.46111	16 04 11.16	-11 56 44.0	415
688	1980 10 28.47291	23 37 45.26	-07 22 44.7	415
688	1980 10 29.47361	23 37 38.55	-07 26 07.7	415
714	1980 07 09.42986	16 19 13.17	-11 56 58.2	415
714	1980 07 12.46111	16 18 16.37	-11 50 05.2	415
752	1980 10 28.47291	23 37 39.89	-11 47 23.4	415
752	1980 10 29.47361	23 37 19.71	-11 45 43.5	415

## OBSERVATIONS MADE AT STAKENBRIDGE BY B. MANNING. COMMUNICATED BY G. M. HURST.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1980k	1980 08 31.87384		14 16 58.64	+26 54 01.7	494
/1980k	1980 09 05.87639		14 34 40.70	+25 34 50.2	494

## OBSERVATIONS MADE WITH THE 1-M SCHMIDT TELESCOPE AT HAUTE PROVENCE BY H. DEBEHOGNE, L. HOUZIAUX, J.-P. SWINGS AND G. SAUSE.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
2176	1980 09 15.04566		00 28 51.57	-01 53 09.6	17.3	511
2176	1980 09 15.06009		00 28 50.94	-01 53 14.0		511
2176	1980 09 15.07454		00 28 50.31	-01 53 18.3		511
1980 RT1 *	1980 09 15.04566		00 22 05.63	-00 50 52.2	18.1	511
1980 RT1	1980 09 15.06009		00 22 05.01	-00 50 58.6		511
1980 RT1	1980 09 15.07454		00 22 04.42	-00 51 05.3		511
1980 RU1 *	1980 09 15.04566		00 24 37.41	-01 12 13.7	17.8	511
1980 RU1	1980 09 15.06009		00 24 36.90	-01 12 27.9		511
1980 RU1	1980 09 15.07454		00 24 36.40	-01 12 41.7		511
1980 RV1 *	1980 09 15.04566		00 24 59.10	-00 46 09.5	17.9	511
1980 RV1	1980 09 15.06009		00 24 58.29	-00 46 10.8		511
1980 RV1	1980 09 15.07454		00 24 57.49	-00 46 12.1		511
1980 RW1 *	1980 09 15.04566		00 30 48.88	-03 51 23.1	17.7	511
1980 RW1	1980 09 15.06009		00 30 48.10	-03 51 27.9		511
1980 RW1	1980 09 15.07454		00 30 47.33	-03 51 31.9		511
1980 RX1 *	1980 09 15.04566		00 33 50.93	-02 09 06.8	16.3	511
1980 RX1	1980 09 15.06009		00 33 50.28	-02 09 14.3		511
1980 RX1	1980 09 15.07454		00 33 49.64	-02 09 21.9		511

## OBSERVATIONS MADE AT FALKENSEE BY M. GRESSMANN.

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
258	1980 08 15.94019		21 58 40.24	+11 34 03.4	1	542
258	1980 08 15.94367		21 58 40.14	+11 34 01.0		542
258	1980 08 15.94699		21 58 40.04	+11 34 02.8	1	542
258	1980 08 16.91662		21 58 00.14	+11 28 16.6		542
258	1980 08 16.92065		21 57 59.70	+11 28 14.7		542
258	1980 08 17.91273		21 57 18.74	+11 21 58.9		542
258	1980 08 17.91616		21 57 18.50	+11 21 58.2		542

258	1980	08	17.91940	21	57	18.34	+11	21	56.8	542
258	1980	09	02.89517	21	46	21.99	+08	57	56.1	542
258	1980	09	02.89847	21	46	21.86	+08	57	53.3	542
258	1980	09	02.90888	21	46	21.31	+08	57	46.5	542
258	1980	09	03.87406	21	45	45.86	+08	46	51.3	542
258	1980	09	03.87727	21	45	45.80	+08	46	50.2	542
258	1980	09	03.88188	21	45	45.46	+08	46	45.8	542
258	1980	09	07.85804	21	43	28.47	+07	59	55.3	542
258	1980	09	07.86163	21	43	28.37	+07	59	53.8	542
258	1980	09	07.86530	21	43	28.38	+07	59	49.6	542
284	1980	08	15.97737	22	31	09.02	+08	05	18.0	1 542
284	1980	08	15.98041	22	31	08.92	+08	05	17.3	1 542
284	1980	08	15.98385	22	31	08.75	+08	05	17.6	542
284	1980	08	16.96564	22	30	25.13	+08	02	06.6	1 542
284	1980	08	17.93959	22	29	40.19	+07	58	26.9	5 542
284	1980	08	17.94304	22	29	40.00	+07	58	25.4	5 542
284	1980	08	17.94655	22	29	39.79	+07	58	26.5	5 542
386	1980	08	10.98189	22	32	49.15	+00	25	18.3	542
386	1980	08	10.98486	22	32	48.94	+00	25	16.0	542
386	1980	08	10.98809	22	32	48.93	+00	25	13.6	542
386	1980	08	15.96584	22	30	01.25	-00	27	39.5	1 542
386	1980	08	15.96899	22	30	01.22	-00	27	40.8	1 542
386	1980	08	15.97196	22	30	01.01	-00	27	43.5	1 542
386	1980	08	16.97925	22	29	24.47	-00	39	08.4	542
386	1980	08	17.95259	22	28	49.32	-00	50	17.6	542
386	1980	08	17.95557	22	28	49.16	-00	50	22.0	542
386	1980	08	17.95863	22	28	49.04	-00	50	23.8	542
386	1980	09	03.89905	22	17	37.87	-04	27	05.1	542
386	1980	09	03.90218	22	17	37.71	-04	27	07.8	542
386	1980	09	03.90569	22	17	37.59	-04	27	10.4	542
386	1980	09	07.88553	22	15	02.83	-05	21	08.3	542
386	1980	09	07.88916	22	15	02.66	-05	21	12.2	542
386	1980	09	07.89286	22	15	02.53	-05	21	14.3	542
776	1980	04	14.91924	12	43	35.07	+21	18	36.7	1 542
776	1980	04	14.92419	12	43	34.97	+21	18	36.0	542
776	1980	04	14.92972	12	43	34.69	+21	18	36.8	542
776	1980	04	15.92114	12	42	48.68	+21	18	51.6	542
776	1980	04	15.92598	12	42	48.41	+21	18	49.4	542
925	1980	08	16.99354	23	25	44.99	+21	30	16.8	542
925	1980	08	16.99743	23	25	44.98	+21	30	17.0	542
925	1980	08	17.00107	23	25	44.94	+21	30	16.8	542
925	1980	08	17.97692	23	25	01.77	+21	35	25.4	542
925	1980	08	17.98019	23	25	01.64	+21	35	25.9	542
925	1980	08	17.98396	23	25	01.40	+21	35	28.1	542
925	1980	09	03.92698	23	10	06.18	+22	27	23.9	542
925	1980	09	03.93040	23	10	06.01	+22	27	24.6	542
925	1980	09	03.93385	23	10	05.67	+22	27	25.9	542
925	1980	09	07.93394	23	06	07.79	+22	28	51.4	542
925	1980	09	07.93709	23	06	07.66	+22	28	53.0	542
925	1980	09	07.94082	23	06	07.59	+22	28	53.9	542
980	1980	08	10.96853	22	23	26.88	+11	34	30.1	542
980	1980	08	10.97277	22	23	26.68	+11	34	30.9	542
980	1980	08	10.97587	22	23	26.56	+11	34	33.0	542
980	1980	08	15.95292	22	19	09.13	+12	04	10.6	542
980	1980	08	15.95597	22	19	08.95	+12	04	12.2	542
980	1980	08	15.95879	22	19	08.70	+12	04	11.5	542
980	1980	08	16.93959	22	18	15.42	+12	09	11.1	5 542
980	1980	08	16.94293	22	18	15.30	+12	09	12.4	5 542



980	1980 08 16.94626	22 18 15.09	+12 09 13.7	5	542
980	1980 08 17.92611	22 17 21.07	+12 13 53.2		542
980	1980 08 17.92983	22 17 20.92	+12 13 56.5		542
980	1980 08 17.93281	22 17 20.77	+12 13 55.4		542
980	1980 09 02.95787	22 02 01.19	+12 50 55.6		542
980	1980 09 02.96199	22 02 00.92	+12 50 53.0		542
980	1980 09 02.96552	22 02 00.77	+12 50 53.8		542
980	1980 09 03.88669	22 01 09.61	+12 50 48.9		542
980	1980 09 03.88972	22 01 09.49	+12 50 48.2		542
980	1980 09 03.89270	22 01 09.24	+12 50 47.4		542
980	1980 09 07.87174	21 57 35.34	+12 47 51.7		542
980	1980 09 07.87537	21 57 34.92	+12 47 50.7		542
980	1980 09 07.87884	21 57 34.73	+12 47 51.8		542
1001	1980 09 07.91188	22 45 43.06	+07 39 28.8	1	542
1001	1980 09 07.91829	22 45 42.97	+07 39 27.4	3	542
1001	1980 09 07.92656	22 45 42.48	+07 39 29.1	3	542
1069	1978 05 29.92503	14 41 24.00	+04 42 07.6	6	542
1093	1980 04 14.95572	13 11 04.39	+18 49 32.0		542
1093	1980 04 14.96164	13 11 03.92	+18 49 34.2	3	542
1093	1980 04 15.93401	13 10 09.75	+18 49 05.2	3	542
1093	1980 04 15.94003	13 10 09.69	+18 49 02.6	3	542
1685	1980 08 04.95958	23 49 49.71	+55 49 20.8	8	542
1685	1980 08 04.96928	23 49 57.35	+55 51 07.4	9	542
1685	1980 08 04.97661	23 50 02.38	+55 52 12.1	8	542
1685	1980 08 10.94178	01 51 51.92	+69 23 24.6		542
1685	1980 08 10.94945	01 52 05.73	+69 24 07.3		542
1685	1980 08 10.95792	01 52 21.07	+69 24 57.7		542

Note 1: measurement uncertain. 2: trail very weak. 3 = 1 + 2. 4: near edge of plate. 5 = 1 + 4. 6: correction to MPC 4686. 7: interference from clouds. 8 = 1 + 7. 9 = 2 + 7.

## OBSERVATIONS MADE AT THE OSSERVATORIO S. VITTORE.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1980 RD	1980 09 12.91042		22 24 30.96	-06 29 12.1	17.0	552
1980 RD	1980 09 12.92708		22 24 30.03	-06 29 13.5		552

## OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT TELESCOPE AT PALOMAR. OBSERVATIONS IDENTIFIED BY C. J. VAN HOUTEN AND I. VAN HOUTEN-GROENEVELD ON EXPOSURES BY T. GEHRELS.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1106	1960 09 24.27708		00 24 30.44	+16 39 52.5	675
1106	1960 09 25.22986		00 23 35.26	+16 37 53.8	675
1106	1960 09 25.36042		00 23 27.44	+16 37 37.4	675
1106	1960 09 25.46250		00 23 21.31	+16 37 24.4	675
1106	1960 09 26.24514		00 22 36.10	+16 35 41.0	675
1106	1960 09 26.40208		00 22 26.74	+16 35 18.9	675
1106	1960 09 27.27569		00 21 35.89	+16 33 14.4	675
1106	1960 09 27.44444		00 21 25.78	+16 32 48.3	675
1106	1960 09 28.34722		00 20 33.22	+16 30 32.3	675
1106	1960 09 28.40764		00 20 29.54	+16 30 22.4	675
1106	1960 09 28.46181		00 20 26.25	+16 30 14.4	675
1106	1960 09 29.34722		00 19 34.62	+16 27 51.2	675
1106	1960 09 29.47153		00 19 27.16	+16 27 31.0	675
1106	1960 10 22.17778		23 59 16.67	+14 59 21.2	675
1106	1960 10 26.28264		23 56 27.57	+14 40 58.7	675
2155	1960 09 24.35002		23 58 07.48	-03 02 09.4	675
2155	1960 09 26.28543		23 56 33.31	-03 10 31.9	675
2155	1960 09 27.34237		23 55 41.99	-03 15 01.4	675

2155		1960 09 28.33822	23 54 54.07	-03 19 11.6	675
2155		1960 10 17.22501	23 41 47.20	-04 20 33.2	675
2155		1960 10 22.16324	23 39 21.88	-04 29 07.7	675
2155		1960 10 24.23753	23 38 30.60	-04 31 37.2	675
2155		1960 10 26.27157	23 37 46.13	-04 33 25.0	675
2256		1960 09 24.41183	00 29 44.56	+02 28 34.7	675
2256		1960 09 26.31530	00 28 17.93	+02 19 09.3	675
2256		1960 09 27.40836	00 27 27.79	+02 13 43.9	675
2256		1960 09 28.39725	00 26 42.45	+02 08 49.4	675
2256		1960 10 17.27085	00 13 17.44	+00 42 28.7	675
2256		1960 10 17.31529	00 13 15.70	+00 42 16.8	675
2256		1960 10 22.22293	00 10 28.25	+00 24 38.7	675
2256		1960 10 24.35836	00 09 23.12	+00 17 54.1	675
2256		1960 10 26.32573	00 08 28.02	+00 12 09.2	675
2289		1960 09 24.35002	23 51 35.13	-00 13 48.7	675
2289		1960 09 26.28543	23 49 59.92	-00 25 38.3	675
2289		1960 09 27.34237	23 49 08.44	-00 32 00.7	675
2289		1960 09 28.33822	23 48 20.27	-00 38 00.4	675
2289		1960 10 17.21390	23 35 25.12	-02 16 32.6	675
2289		1960 10 22.15559	23 33 03.47	-02 35 33.0	675
2289		1960 10 24.18787	23 32 14.27	-02 42 20.2	675
2289		1960 10 26.26113	23 31 29.78	-02 48 38.0	675
2580	P-L *	1960 09 24.46184	00 53 56.40	+01 45 10.5	675
2580	P-L	1960 09 26.37988	00 52 13.22	+01 34 56.5	675
2580	P-L	1960 09 28.43822	00 50 20.06	+01 23 53.5	675
2580	P-L	1960 09 29.39514	00 49 26.83	+01 18 43.2	675
2580	P-L	1960 10 17.31529	00 32 44.65	-00 11 55.8	675
2580	P-L	1960 10 22.26809	00 28 33.93	-00 32 12.9	675
2580	P-L	1960 10 25.30351	00 26 11.98	-00 43 02.4	675
2580	P-L	1960 10 26.35766	00 25 25.08	-00 46 30.9	675
2605	P-L *	1960 09 24.46184	00 40 09.80	+03 44 20.7	675
2605	P-L	1960 09 26.37988	00 38 27.55	+03 38 12.1	675
2605	P-L	1960 09 28.39725	00 36 38.86	+03 31 37.6	675
2605	P-L	1960 09 28.43822	00 36 36.38	+03 31 29.7	675
2605	P-L	1960 10 17.31529	00 20 40.92	+02 34 31.4	675
2605	P-L	1960 10 22.26809	00 17 24.20	+02 24 07.8	675
2605	P-L	1960 10 25.30351	00 15 40.96	+02 19 17.3	675
2605	P-L	1960 10 26.32573	00 15 09.28	+02 17 56.2	675
2605	P-L	1960 10 26.35766	00 15 08.28	+02 17 52.4	675
3537	P-L *	1960 10 17.17917	00 19 04.65	+13 45 12.1	675
3537	P-L	1960 10 17.33750	00 18 57.19	+13 44 17.5	675
3537	P-L	1960 10 22.12083	00 15 31.16	+13 17 14.4	675
3537	P-L	1960 10 24.21256	00 14 09.38	+13 05 30.0	675
3537	P-L	1960 10 24.30972	00 14 05.52	+13 04 57.1	675
3537	P-L	1960 10 26.28264	00 12 54.08	+12 54 02.3	675
3537	P-L	1960 10 26.37951	00 12 50.58	+12 53 29.6	675
4578	P-L *	1960 09 24.41183	00 24 50.85	-00 50 14.4	675
4578	P-L	1960 09 26.31530	00 23 27.15	-01 07 38.3	675
4578	P-L	1960 09 27.40836	00 22 38.22	-01 17 31.7	675
4578	P-L	1960 09 28.39725	00 21 54.40	-01 26 23.8	675
4578	P-L	1960 10 17.28198	00 10 00.84	-03 43 31.3	675
4578	P-L	1960 10 22.23406	00 08 11.89	-04 04 43.1	675
4578	P-L	1960 10 25.25350	00 07 27.73	-04 13 58.3	675
4578	P-L	1960 10 26.31531	00 07 16.27	-04 16 34.2	675
7071	P-L *	1960 10 17.27085	00 02 18.27	+04 56 10.4	675
7071	P-L	1960 10 22.22293	00 01 03.69	+02 49 49.8	675
7071	P-L	1960 10 24.35836	00 00 45.76	+01 58 51.5	675
7071	P-L	1960 10 26.32573	00 00 37.71	+01 14 04.4	675

OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT TELESCOPE AT PALOMAR BY C. KOWAL,  
J. GIBSON, E. HELIN AND S. DUNBAR. MEASURED BY KOWAL AND GIBSON.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
1943	1980 09	13.49308	00 14 57.04	+22 58 25.0			675
1943	1980 09	13.51182	00 14 55.73	+22 58 15.5			675
1943	1980 10	19.43127	23 28 02.47	+13 05 31.3		1	675
1980 PC1 *	1980 08	04.27569	21 17 47.37	-09 10 24.6	16	2	675
1980 PC1	1980 08	04.32778	21 17 42.10	-09 09 22.3			675
1980 PC1	1980 08	05.32361	21 15 59.26	-08 49 01.1			675
1980 PC1	1980 08	05.37569	21 15 53.91	-08 47 58.8			675
1980 RZ1 *	1980 09	13.49308	00 21 02.67	+23 45 26.9	17.5	3	675
1980 RZ1	1980 09	13.51182	00 21 01.94	+23 45 27.5			675

Note 1: measurement difficult. 2: discoverer Kowal. 3: discoverer Gibson.

OBSERVATIONS MADE WITH THE 0.46-M SCHMIDT TELESCOPE AT PALOMAR BY E. HELIN  
AND S. J. BUS. SCANNED AND MEASURED BY C. S. SHOEMAKER.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
403	1980 06	11.37847	17 10 36.98	-19 28 49.9		675
403	1980 06	12.29306	17 09 48.01	-19 25 26.4		675
403	1980 06	18.39723	17 04 24.94	-19 03 23.7		675
403	1980 06	19.36806	17 03 35.22	-19 00 00.9		675
403	1980 06	20.36042	17 02 44.94	-18 56 33.0		675
429	1980 06	10.27083	16 50 49.18	-13 45 54.5		675
429	1980 06	11.37847	16 49 48.29	-13 41 39.9		675
429	1980 06	12.29306	16 48 58.97	-13 38 16.1		675
798	1980 06	10.27083	16 59 32.92	-13 09 21.1		675
798	1980 06	11.37847	16 58 38.63	-13 05 52.1		675
798	1980 06	12.29306	16 57 54.80	-13 03 03.1		675
868	1980 06	10.27083	17 12 43.08	-17 41 38.0		675
868	1980 06	11.37847	17 11 41.10	-17 41 52.5		675
868	1980 06	12.29306	17 10 50.53	-17 42 03.7		675
1111	1980 06	11.37847	17 11 54.96	-18 18 16.7		675
1111	1980 06	12.29306	17 11 08.22	-18 17 55.9		675
1111	1980 06	18.39723	17 05 56.02	-18 16 20.8		675
1111	1980 06	19.36806	17 05 07.41	-18 16 09.9		675
1111	1980 06	20.36042	17 04 18.20	-18 16 03.6		675
1295	1980 06	11.37847	17 07 17.62	-19 06 17.1		675
1562	1980 06	10.27083	17 12 27.01	-15 42 14.2		675
1562	1980 06	11.37847	17 11 16.59	-15 43 24.0		675
1562	1980 06	12.29306	17 10 19.68	-15 44 22.5		675
1646	1980 06	10.27083	16 51 45.31	-12 48 53.7		675
1646	1980 06	11.37847	16 50 37.09	-12 49 59.9		675
1646	1980 06	18.39723	16 43 38.05	-12 59 08.8		675
1646	1980 06	19.36806	16 42 42.38	-13 00 48.8		675
2195	1980 06	11.37847	17 02 48.79	-19 43 38.7	16.5	675
2195	1980 06	12.29306	17 01 47.88	-19 44 02.9	16.5	675
2195	1980 06	18.39723	16 55 03.91	-19 47 14.1	16.5	675
2195	1980 06	19.36806	16 54 01.61	-19 47 49.5	16.5	675
2195	1980 06	20.36042	16 52 58.88	-19 48 26.9	16.5	675
2279	1980 06	10.27083	16 54 00.66	-17 36 36.7	16.5	675
2279	1980 06	11.37847	16 52 57.00	-17 36 16.0	16.5	675
2279	1980 06	12.29306	16 52 05.57	-17 36 02.1	16.5	675
2279	1980 06	18.39723	16 46 34.40	-17 35 43.4	16.5	675
2279	1980 06	19.36806	16 45 45.29	-17 35 55.3	16.5	675
2279	1980 06	20.36042	16 44 56.08	-17 36 10.3	16.5	675
2287	1980 06	10.27083	16 51 16.23	-19 24 06.3	15.5	675
2287	1980 06	11.37847	16 50 04.58	-19 26 44.7	15.5	675
2287	1980 06	12.29306	16 49 06.61	-19 28 57.9	15.5	675
1980 LO	1980 06	10.27083	16 40 34.06	-14 19 23.9	16.5	675

1980 LP	1980 06 10.27083	16 47 13.95	-15 57 52.6	16.5	675
1980 LP	1980 06 11.37847	16 46 02.78	-15 59 56.9	16.5	675
1980 LP	1980 06 12.29306	16 45 05.11	-16 01 25.4	16.5	675
1980 LP	1980 06 18.39723	16 38 47.18	-16 14 55.5	16.5	675
1980 LQ *	1980 06 10.27083	16 42 47.60	-16 51 20.0	17	675
1980 LQ	1980 06 11.37847	16 41 43.86	-16 45 59.8	17	675
1980 LQ	1980 06 12.29306	16 40 52.88	-16 41 40.9	17	675
1980 LR *	1980 06 10.27083	16 47 16.67	-13 10 21.5	17.5	675
1980 LS *	1980 06 10.27083	16 49 21.76	-12 40 55.8	17.5	675
1980 LT *	1980 06 10.27083	16 54 31.34	-19 10 01.3	17	675
1980 LU *	1980 06 10.27083	16 57 18.85	-16 17 15.7	17.5	675
1980 LU	1980 06 11.37847	16 56 18.50	-16 15 48.7	17.5	675
1980 LU	1980 06 12.29306	16 55 29.83	-16 14 41.6	17.5	675
1980 LU	1980 06 18.39723	16 50 12.88	-16 09 16.6	17.5	675
1980 LV *	1980 06 10.27083	17 02 22.92	-17 10 21.0	17.5	675
1980 LW *	1980 06 10.27083	17 02 30.60	-12 52 51.1	17.5	675
1980 LW	1980 06 11.37847	17 01 24.55	-12 51 34.6	17.5	675
1980 LX *	1980 06 10.27083	17 03 02.89	-15 40 33.4	17.5	675
1980 LY *	1980 06 10.27083	17 03 04.71	-18 50 40.2	17	675
1980 LY	1980 06 12.29306	17 01 01.90	-18 56 17.1	17	675
1980 LY	1980 06 18.39723	16 55 01.83	-19 14 35.3	17	675
1980 LY	1980 06 19.36806	16 54 07.61	-19 17 41.8	17	675
1980 LY	1980 06 20.36042	16 53 13.40	-19 20 54.2	17	675
1980 LZ *	1980 06 10.27083	17 05 53.30	-12 45 18.4	17.5	675
1980 LA1 *	1980 06 11.37847	16 55 31.18	-15 54 52.4	18	675
1980 LB1	1980 06 10.27083	16 57 52.59	-13 35 05.1	17.5	675
1980 LB1 *	1980 06 11.37847	16 56 58.21	-13 31 58.4	17.5	675
1980 LB1	1980 06 12.29306	16 56 15.35	-13 29 24.9	17.5	675
1980 LB1	1980 06 18.39723	16 51 29.33	-13 13 56.4	17.5	675
1980 LB1	1980 06 19.36806	16 50 45.41	-13 11 45.6	17.5	675
1980 LB1	1980 06 20.36042	16 50 01.18	-13 09 36.4	17.5	675
1980 LC1 *	1980 06 11.37847	16 57 20.88	-13 15 54.9	17.5	675
1980 LC1	1980 06 12.29306	16 56 22.14	-13 20 56.6	17.5	675
1980 LC1	1980 06 18.39723	16 49 50.89	-13 57 38.4	17.5	675
1980 LC1	1980 06 19.36806	16 48 50.51	-14 03 51.0	17.5	675
1980 LC1	1980 06 20.36042	16 47 49.12	-14 10 20.5	17.5	675
1980 LD1 *	1980 06 11.37847	16 59 44.32	-20 31 45.5	16.5	675
1980 LD1	1980 06 12.29306	16 58 58.71	-20 31 17.8	16.5	675
1980 LE1	1980 06 10.27083	17 13 48.21	-15 53 32.1	17	675
1980 LE1 *	1980 06 11.37847	17 12 45.77	-15 45 45.1	17	675
1980 LE1	1980 06 12.29306	17 11 55.45	-15 39 25.4	17	675
1980 LE1	1980 06 18.39723	17 06 22.98	-14 58 47.9	17	675
1980 LE1	1980 06 19.36806	17 05 32.21	-14 52 45.5	17	675
1980 LE1	1980 06 20.36042	17 04 41.13	-14 46 37.6	17	675
1980 MD	1980 06 10.27083	16 48 39.82	-13 48 05.6	17	675
1980 MD	1980 06 11.37847	16 47 48.75	-13 48 38.1	17	675
1980 MD	1980 06 18.39723	16 42 35.60	-13 53 38.4	17	675
1980 MD	1980 06 19.36806	16 41 53.77	-13 54 36.5	17	675

OBSERVATIONS MADE WITH THE 0.46-M SCHMIDT TELESCOPE AT PALOMAR BY E. HELIN  
AND S. J. BUS. SCANNED BY J. G. WILLIAMS. MEASURED BY J. GIBSON.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
1212	1976 08 30.22917	22 27 04.39	-10 45 21.8	17	675	
2285	1976 08 27.45278	22 18 57.62	-09 34 04.2		675	
2285	1976 08 28.40590	22 18 19.09	-09 43 54.5		675	
2285	1976 08 30.22917	22 17 06.18	-10 02 39.2	16	675	
2285	1976 09 27.18333	22 05 54.45	-13 48 35.9		1 675	
2285	1976 09 27.25139	22 05 54.27	-13 48 56.6		1 675	
1976 QA	1976 08 27.45278	22 19 19.46	-09 24 09.7		675	

1976 QA	1976 08 28.40590	22 18 28.73	-09 26 27.3		675
1976 QA	1976 08 30.22917	22 16 52.66	-09 30 42.8		675
1976 QL	1976 08 27.45278	22 12 55.12	-06 02 27.9	2	675
1976 QL	1976 08 28.40590	22 12 06.70	-06 03 16.1	16	675
1976 QL	1976 08 30.22917	22 10 35.61	-06 04 56.5	15.8	675
1976 QL	1976 09 27.17292	21 55 49.23	-06 24 54.8	3	675
1976 QM	1976 08 27.45278	22 15 05.80	-08 56 22.4		675
1976 QM	1976 08 28.40590	22 14 21.63	-08 59 56.6	16.5	675
1976 QM	1976 08 30.22917	22 12 58.18	-09 06 46.4	16.5	675
1976 QN	1976 08 27.45278	22 15 36.60	-11 01 29.4		675
1976 QN	1976 08 28.40590	22 14 43.43	-11 06 23.5	16.5	675
1976 QN	1976 08 30.22917	22 13 02.94	-11 15 35.4	17	675
1976 QP	1976 08 27.45278	22 21 24.22	-06 44 02.4		675
1976 QP	1976 08 28.40590	22 20 38.33	-06 49 08.9	17	675
1976 QP	1976 08 30.22917	22 19 11.17	-06 58 58.8	17	675
1976 QQ	1976 08 30.22917	22 19 09.63	-07 44 37.8	16.5	675
1976 QR	1976 08 27.45278	22 23 28.64	-07 09 18.8		675
1976 QR	1976 08 28.40590	22 22 46.28	-07 20 52.0	16	675
1976 QR	1976 08 30.22917	22 21 25.05	-07 43 06.0	16.5	675
1976 QS	1976 08 27.45278	22 23 29.91	-09 16 23.1	16	675
1976 QS	1976 08 28.40590	22 22 37.25	-09 13 11.1	16	675
1976 QS	1976 08 30.22917	22 20 57.46	-09 07 02.0		675
1976 QT	1976 08 27.45278	22 24 07.06	-09 03 53.3	15.5	675
1976 QT	1976 08 28.40590	22 23 23.62	-09 11 13.4	15.5	675
1976 QT	1976 08 30.22917	22 22 00.97	-09 25 16.2	15.5	675
1976 QT	1976 09 27.18333	22 05 51.11	-12 25 25.8		675
1976 QT	1976 09 27.25139	22 05 49.87	-12 25 43.2		675
1976 QU	1976 08 28.40590	22 23 27.65	-12 03 42.7		675
1976 QU	1976 08 30.22917	22 21 41.57	-12 03 05.7	17	675
1976 QV	1976 08 27.45278	22 24 48.26	-06 05 44.0	16.5	675
1976 QV	1976 08 30.22917	22 22 08.40	-06 16 32.5	16	675
1976 QW	1976 08 27.45278	22 29 59.28	-05 17 04.7	16.5	675
1976 QX	1976 08 28.40590	22 30 00.76	-09 58 59.9		675
1976 QX	1976 08 30.22917	22 28 31.92	-10 06 43.5	16.5	675
1976 QY	1976 08 27.45278	22 32 17.19	-04 04 27.2	16	675
1976 QG2	1976 08 27.45278	22 17 07.07	-10 11 41.1	16.5	675
1976 QG2 *	1976 08 28.39444	22 16 18.24	-10 20 09.9	17	4 675
1976 QG2	1976 08 30.22917	22 14 41.34	-10 36 58.4	17.5	675
1976 QH2 *	1976 08 28.40590	22 13 25.37	-12 12 56.6	16.5	4 675
1976 QH2	1976 08 30.22917	22 12 09.99	-12 34 22.9	17	675
1976 QJ2	1976 08 27.45278	22 25 06.24	-08 40 53.3	17	675
1976 QJ2 *	1976 08 28.40590	22 24 11.48	-08 47 57.4	17	4 675
1976 QJ2	1976 08 30.22917	22 22 25.12	-09 01 39.8	16.5	675
1976 ST	1976 09 27.18333	21 54 08.97	-16 28 13.4	16	675
1976 ST	1976 09 27.25139	21 54 07.60	-16 28 29.4		675
1976 SU	1976 09 27.17292	22 00 39.69	-10 50 22.6		675
1976 SW	1976 09 27.17292	22 04 11.22	-07 20 39.0		675
1976 SX	1976 09 27.18333	22 04 43.60	-12 58 08.4		675
1976 SX	1976 09 27.25139	22 04 42.16	-12 58 45.0		675

Note 1: remeasurement of positions published on MPC 4155. 2: image on faint star. 3: weak image; may be spurious or combined with faint star image. 4: discoverer Williams.

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY (CODE 690) BY H. L. GICLAS AND AT THE ANDERSON MESA STATION (CODE 688) BY GICLAS, E. BOWELL, B. A. SKIFF AND N. G. THOMAS. MEASURED BY BOWELL.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
/1977 XI	1980 11 04.48368	13 06 01.90	+28 53 43.2			688
/1977 XI	1980 11 04.50313	13 06 12.40	+28 50 15.7			3 688

/1977 XI	1980	11	04.50938	13	06	15.42	+28	49	16.6	688
/1980b	1980	11	17.50764	12	05	43.75	+00	47	01.7	688
/1980g	1980	11	02.24618	05	15	30.63	+07	17	42.0	688
/1980g	1980	11	06.25451	05	19	03.66	+08	32	36.7	688
/1980h	1980	11	17.49479	10	24	53.95	+21	05	52.8	688
/1980q	1980	11	08.10278	18	04	27.35	+40	55	24.1	688
/1980q	1980	11	09.15347	18	03	33.41	+40	17	22.2	688
/1980q	1980	11	11.11667	18	02	03.11	+39	08	56.0	688
/1980q	1980	11	12.11944	18	01	21.57	+38	35	15.9	688
/1980q	1980	11	13.10625	18	00	43.38	+38	02	55.8	688
/1980q	1980	11	17.11806	17	58	33.90	+35	59	33.3	1 688
10	1980	11	09.31250	03	51	50.04	+24	05	48.9	688
10	1980	11	09.34722	03	51	48.17	+24	05	43.5	688
24	1980	11	17.50764	12	01	04.08	+00	27	10.0	688
25	1980	10	10.15278	23	55	10.35	+17	36	53.5	688
25	1980	10	10.19653	23	55	08.99	+17	35	56.8	688
86	1980	11	11.13750	00	53	17.48	-01	22	21.7	688
98	1980	10	10.13056	23	15	31.11	-03	21	45.3	688
98	1980	10	10.17500	23	15	29.08	-03	21	47.3	688
100	1980	11	17.50764	12	05	38.38	+03	15	23.7	688
101	1980	10	02.13750	21	55	56.44	-12	14	27.4	688
112	1980	09	14.33056	23	20	15.61	-01	49	38.3	688
112	1980	10	01.21528	23	06	33.72	-02	55	24.1	688
126	1980	11	17.50764	11	59	21.33	+01	53	39.3	688
197	1980	10	08.27188	03	58	02.78	+12	29	12.7	688
197	1980	10	10.27951	03	57	21.35	+12	27	49.0	688
197	1980	10	29.22882	03	45	34.10	+12	10	49.7	688
197	1980	11	02.26215	03	42	03.07	+12	07	05.2	688
197	1980	11	06.20313	03	38	23.41	+12	03	43.4	688
197	1980	11	08.23403	03	36	26.23	+12	02	10.1	688
197	1980	11	09.30000	03	35	23.79	+12	01	24.8	688
197	1980	11	14.30347	03	30	27.10	+11	58	28.6	688
228	1980	10	02.15486	21	50	24.56	-09	41	01.6	688
240	1980	11	06.18472	01	16	39.41	+04	04	14.9	688
240	1980	11	06.22153	01	16	37.97	+04	04	08.6	688
252	1980	10	02.25243	22	18	34.83	-01	27	24.6	688
252	1980	10	05.18750	22	17	42.85	-01	46	40.0	688
282	1980	10	02.13750	22	03	53.25	-16	48	47.0	688
287	1980	11	06.25451	05	23	22.91	+07	59	51.5	688
294	1980	10	08.27188	03	53	03.93	+11	15	33.7	688
294	1980	10	10.27951	03	52	21.98	+11	08	47.6	688
336	1980	11	09.18472	01	23	47.04	+12	31	37.2	688
336	1980	11	09.21806	01	23	45.53	+12	31	21.9	688
337	1980	10	02.13750	21	58	13.94	-15	14	12.0	688
344	1980	11	09.31250	03	58	14.84	+25	02	20.5	688
344	1980	11	09.34722	03	58	12.48	+25	02	24.7	688
355	1980	10	08.22569	22	26	16.45	-10	08	17.3	688
380	1980	11	08.22014	02	54	07.90	+08	29	35.3	688
380	1980	11	08.24792	02	54	06.25	+08	29	30.2	688
386	1980	10	02.13750	22	04	25.95	-10	21	30.2	688
400	1980	10	02.25243	22	01	08.73	-08	40	55.5	688
407	1980	11	06.11319	00	48	53.67	+18	25	01.9	688
407	1980	11	06.15417	00	48	52.24	+18	24	46.0	688
440	1980	10	10.13056	23	17	28.80	-01	48	50.0	688
440	1980	10	10.17500	23	17	26.86	-01	49	03.5	688
465	1980	11	09.18472	01	23	00.51	+15	26	57.9	688
465	1980	11	09.21806	01	22	59.09	+15	26	49.2	688
467	1980	11	08.13264	00	52	53.61	+15	24	36.5	688
467	1980	11	08.17083	00	52	52.33	+15	24	25.9	688

467	1980	11	11.23056	00	51	18.95	+15	11	31.9	688
467	1980	11	11.27639	00	51	17.76	+15	11	19.1	688
510	1980	10	29.22882	03	47	17.73	+13	11	16.5	688
510	1980	11	02.26215	03	43	58.50	+12	45	29.0	688
510	1980	11	06.20313	03	40	31.89	+12	20	16.3	688
510	1980	11	08.23403	03	38	41.87	+12	07	23.0	688
510	1980	11	09.30000	03	37	43.30	+12	00	40.8	688
510	1980	11	14.30347	03	33	05.31	+11	29	49.9	688
534	1980	11	02.27535	05	39	21.03	+21	29	48.7	688
534	1980	11	06.26563	05	38	06.50	+21	31	05.8	688
534	1980	11	08.26111	05	37	19.14	+21	31	44.2	688
534	1980	11	09.37708	05	36	49.61	+21	32	06.4	688
534	1980	11	14.31389	05	34	15.72	+21	33	37.3	688
648	1980	10	02.15486	21	25	49.74	-06	06	35.0	688
762	1980	09	07.29722	22	14	59.64	-00	08	35.2	688
762	1980	10	02.25243	21	59	36.83	-01	11	51.9	688
805	1980	10	02.13750	22	06	42.13	-10	26	21.5	688
823	1980	07	19.34722	22	54	30.85	-01	21	00.2	688
823	1980	10	02.25243	22	00	08.80	-06	03	07.9	688
823	1980	10	04.15069	21	59	28.59	-06	10	38.9	688
853	1980	10	02.15486	21	50	28.42	-08	03	36.5	688
863	1980	02	11.23715	08	02	33.94	+25	50	50.8	688
904	1980	11	06.18472	01	22	32.44	+04	12	25.5	688
904	1980	11	06.22153	01	22	31.13	+04	12	07.4	688
931	1980	11	06.25451	05	18	15.04	+10	15	22.5	688
977	1980	11	02.27535	05	40	50.61	+22	12	51.9	688
977	1980	11	06.26563	05	39	19.25	+22	25	55.7	688
977	1980	11	08.26111	05	38	24.67	+22	32	34.0	688
977	1980	11	09.37708	05	37	51.49	+22	36	18.5	688
977	1980	11	14.31389	05	35	04.29	+22	53	02.0	688
1053	1980	11	09.18472	01	31	43.95	+14	00	50.5	688
1053	1980	11	09.21806	01	31	42.32	+14	00	48.2	688
1078	1980	10	02.18889	22	20	39.87	-21	31	10.7	688
1078	1980	10	02.22986	22	20	38.46	-21	31	12.2	688
1087	1980	09	17.40625	04	13	57.72	+24	31	11.9	688
1095	1980	10	02.15486	21	38	17.90	-08	52	59.8	688
1171	1980	10	02.13750	21	55	15.90	-15	26	25.8	688
1187	1980	10	02.25243	22	08	06.88	-04	39	46.5	688
1317	1980	10	02.18889	22	17	37.92	-24	49	41.8	688
1339	1980	10	02.15486	21	29	37.95	-06	02	36.3	688
1392	1980	09	14.33056	23	26	00.07	-07	06	07.3	688
1396	1980	09	14.33056	23	14	11.94	-06	34	11.4	688
1396	1980	10	01.23889	22	58	57.46	-07	16	47.8	688
1463	1980	10	02.25243	22	17	08.88	-07	43	18.9	688
1463	1980	10	04.18542	22	16	17.99	-07	44	21.4	688
1463	1980	10	08.19722	22	14	48.72	-07	45	13.3	688
1563	1980	11	06.09236	00	51	59.09	+00	31	08.1	688
1563	1980	11	06.13333	00	51	57.05	+00	31	08.0	688
1563	1980	11	09.16742	00	49	52.52	+00	30	06.3	688
1563	1980	11	09.20139	00	49	51.06	+00	30	05.9	688
1563	1980	11	11.13750	00	48	39.84	+00	30	21.8	688
1563	1980	11	11.20764	00	48	37.27	+00	30	23.8	688
1578	1980	10	02.13750	22	08	20.36	-12	34	50.3	688
1579	1980	11	08.22014	02	45	47.85	+08	00	26.2	688
1579	1980	11	08.24792	02	45	46.59	+08	00	16.4	688
1582	1980	11	09.25347	03	08	25.57	+05	17	17.9	688
1582	1980	11	09.28750	03	08	23.84	+05	17	14.4	688
1589	1980	10	02.18889	22	19	40.37	-19	23	47.0	688
1589	1980	10	02.22986	22	19	39.35	-19	23	46.7	688

1604		1980	10	02.15486	21	29	15.99	-08	08	23.1		688
1627		1980	10	29.18750	03	18	35.76	-02	21	09.0		688
1627		1980	10	29.21319	03	18	33.28	-02	21	15.8		688
1715		1980	11	09.23611	02	02	29.65	+12	05	46.1		688
1715		1980	11	09.27014	02	02	27.53	+12	05	41.2		688
1715		1980	11	13.12083	01	58	44.45	+11	59	15.6	1	688
1715		1980	11	13.13750	01	58	43.76	+11	59	13.8	1	688
1715		1980	11	14.26806	01	57	40.62	+11	57	31.0	3	688
1722		1980	11	08.22014	02	49	17.97	+08	17	47.6	16.5	688
1722		1980	11	08.24792	02	49	16.34	+08	17	37.4		688
1723		1980	10	02.13750	22	06	32.76	-14	37	03.6		688
1766		1980	08	06.33264	22	52	13.52	-01	53	12.8		688
1766		1980	10	02.25243	22	16	10.73	-07	31	06.6		688
1766		1980	10	04.18542	22	15	37.27	-07	40	16.2		688
1766		1980	10	08.19722	22	14	45.33	-07	57	19.1		688
1783		1980	09	07.29722	22	16	49.29	-01	10	18.9		688
1783		1980	10	02.25243	22	02	27.43	-04	19	05.2		688
1784		1980	10	02.13750	22	05	29.09	-14	08	19.6		688
1862		1980	11	12.09965	19	32	06.72	-00	35	40.4	3	688
1862		1980	11	12.10938	19	32	27.48	-00	32	42.0	3	688
1862		1980	11	13.08194	20	08	39.03	+04	33	53.9		688
1862		1980	11	13.08958	20	08	56.64	+04	36	22.1		688
1862		1980	11	17.12500	22	40	49.37	+22	15	50.7	2	688
1862		1980	11	17.12743	22	40	53.81	+22	16	13.0	3	688
1862		1980	11	17.13056	22	40	59.44	+22	16	40.3		688
1862		1980	11	19.09931	23	34	57.12	+26	06	05.6		688
1862		1980	11	19.10278	23	35	01.97	+26	06	21.3		688
1865		1980	11	08.20486	02	35	42.27	-00	53	49.1		688
1865		1980	11	11.29931	02	24	05.55	-05	02	01.8		688
1911		1980	10	10.13056	23	13	04.32	-02	53	58.3	1	688
1911		1980	10	10.17500	23	13	03.13	-02	54	08.1		688
1912		1980	11	06.18472	01	11	44.56	+03	37	32.8		688
1912		1980	11	06.22153	01	11	43.19	+03	37	28.3		688
1973		1980	11	06.09236	00	46	35.90	-00	09	54.0		688
1973		1980	11	06.13333	00	46	34.91	-00	10	04.0	3	688
1973		1980	11	09.20139	00	45	28.86	-00	23	33.9		688
2020		1980	10	02.13750	22	02	39.23	-15	01	14.7		688
2043		1980	11	09.31250	03	51	21.45	+24	57	44.7		688
2043		1980	11	09.34722	03	51	19.62	+24	57	41.2		688
2115		1980	11	09.18472	01	26	28.56	+15	48	53.4		688
2115		1980	11	09.21806	01	26	27.23	+15	48	39.4		688
2145		1980	10	29.12153	23	06	25.01	+15	15	25.9	3	688
2266		1980	11	09.18472	01	27	07.71	+15	41	54.9		688
2266		1980	11	09.21806	01	27	06.56	+15	41	37.8		688
2290		1980	09	04.31319	22	09	04.10	-11	00	34.3		688
2290		1980	09	07.33160	22	06	40.83	-11	30	35.6		688
2290		1980	09	11.25208	22	03	43.36	-12	08	26.7		688
2290		1980	10	02.13750	21	53	01.60	-14	53	25.5	16.8	688
2291		1980	09	07.29722	22	21	34.85	-02	46	17.5		688
2291		1980	10	02.25243	22	08	50.91	-07	03	56.6		688
1931	TV	1980	10	10.13056	23	12	17.23	-01	43	52.4	16.8	688
1931	TV	1980	10	10.17500	23	12	15.82	-01	44	09.4		688
1939	PM	1980	11	09.18472	01	28	08.01	+12	06	49.9	17.0	688
1939	PM	1980	11	09.21806	01	28	06.75	+12	06	38.5		688
1940	GH	1980	11	08.22014	02	53	42.37	+10	01	57.7	16.0	688
1940	GH	1980	11	08.24792	02	53	40.64	+10	01	57.7		688
1957	HJ	1980	10	05.14375	22	49	54.21	+04	11	10.4	16.8	688
1957	HJ	1980	10	05.21389	22	49	52.07	+04	10	45.4		688
1958	RQ	1958	09	10.34583	22	46	50.44	+01	09	22.0		690



1958 RQ	1958 09 11.35069	22 46 30.29	+01 06 47.6		690
1965 QC	1980 11 02.29514	03 47 16.04	-04 26 33.2	15.2	688
1965 QC	1980 11 02.32292	03 47 14.87	-04 26 45.5		688
1969 RY	1980 10 10.15278	23 58 53.43	+16 52 00.5	15.5	688
1969 RY	1980 10 10.19653	23 58 51.79	+16 51 34.2		688
1969 TQ4	1980 11 08.22014	02 49 48.75	+10 09 32.5	16.8	688
1970 OG	1980 11 09.32986	04 27 27.89	-05 00 52.6	16.2	688
1970 OG	1980 11 09.36389	04 27 26.21	-05 00 59.6		688
1974 OS	1980 11 06.11319	00 46 18.53	+19 29 07.0	15.5	688
1974 OS	1980 11 06.15417	00 46 17.09	+19 28 54.0		688
1974 TA1	1980 09 02.24861	22 05 21.86	-10 47 44.0	16.2	688
1974 TA1	1980 09 04.31319	22 04 06.15	-10 58 00.5	16.5	688
1974 TA1	1980 09 07.33160	22 02 18.88	-11 12 40.8		688
1974 TA1	1980 09 11.30347	22 00 04.81	-11 31 15.8		688
1974 TA1	1980 10 02.13750	21 51 43.47	-12 48 28.5	16.8	688
1975 SA	1975 09 28.22708	00 11 47.71	-00 27 29.0		688
1975 SA	1975 10 04.33056	00 07 11.55	-00 58 16.5		688
1975 SA	1975 10 10.25486	00 02 57.61	-01 26 00.6		688
1975 SA	1975 10 11.27639	00 02 15.98	-01 30 27.5		688
1975 UD	1980 11 09.31250	03 51 14.80	+24 03 10.3		688
1975 UD	1980 11 09.34722	03 51 12.75	+24 03 08.7		688
1975 WL1	1980 11 06.09236	00 41 15.00	+00 33 07.1	17.2	688
1975 WL1	1980 11 06.13333	00 41 13.87	+00 33 02.1		3 688
1976 TA	1980 11 09.23611	02 01 36.65	+13 00 10.9	16.5	688
1976 TA	1980 11 09.27014	02 01 34.95	+13 00 01.3		688
1976 TA	1980 11 13.12083	01 58 39.50	+12 39 18.4	17.0	688
1976 TA	1980 11 13.13750	01 58 38.76	+12 39 12.8		688
1976 UH1	1980 10 10.22222	23 47 56.51	-16 47 27.2	16.2	688
1976 UH1	1980 10 10.25208	23 47 54.80	-16 47 21.3		688
1976 YQ2	1980 08 06.36667	22 38 25.66	-00 07 24.5	16.8	688
1976 YQ2	1980 09 07.29722	22 12 22.12	-00 24 48.4		688
1976 YQ2	1980 09 17.32014	22 04 35.20	-00 51 38.9		2 688
1978 GD	1980 11 06.09236	00 46 12.81	-01 19 31.6	17.0	688
1978 GD	1980 11 06.13333	00 46 11.48	-01 19 32.0		688
1978 GD	1980 11 09.16742	00 44 36.68	-01 19 52.9	17.2	688
1978 GD	1980 11 09.20139	00 44 35.66	-01 19 51.8		688
1978 GD	1980 11 11.13750	00 43 40.10	-01 19 30.6		688
1978 GD	1980 11 11.20764	00 43 38.10	-01 19 30.1		688
1979 KA	1980 11 09.25347	03 14 10.03	+03 10 34.9	16.0	688
1979 KA	1980 11 09.28750	03 14 08.16	+03 10 27.4		688
1979 KB	1980 11 06.18472	01 22 57.24	+03 49 43.1	17.2	688
1979 KB	1980 11 06.22153	01 22 55.78	+03 49 32.4		3 688
1980 OB	1980 10 02.15486	21 28 38.11	-08 58 57.6	17.0	688
1980 OC	1980 10 02.13750	21 56 44.42	-11 20 21.4	16.8	688
1980 OD	1980 10 02.13750	22 10 03.29	-17 52 23.2	17.2	688
1980 OE	1980 08 08.36458	22 48 07.42	-06 00 07.0		688
1980 OE	1980 09 07.29722	22 24 22.51	-07 45 14.6		688
1980 OE	1980 10 02.25243	22 12 40.94	-08 49 20.9		688
1980 OF	1980 09 07.29722	22 20 11.29	-02 21 05.7		688
1980 OF	1980 10 02.25243	22 04 59.18	-02 52 49.5		688
1980 OF	1980 10 04.15069	22 04 22.92	-02 54 16.6	17.5	688
1980 PF	1980 07 17.37222	22 51 05.51	-05 25 04.1	17.2	688
1980 PF	1980 09 07.29722	22 13 30.14	-02 14 48.1		688
1980 PF	1980 09 07.35417	22 13 26.79	-02 14 46.8	16.5	688
1980 PF	1980 09 17.32014	22 05 06.18	-02 14 31.3	16.5	688
1980 PF	1980 10 02.25243	21 58 28.77	-02 12 52.6		688
1980 PG	1980 07 17.33056	23 00 58.75	-04 38 29.0		2 688
1980 PG	1980 07 17.37222	23 00 58.13	-04 38 18.1	17.5	688

1980 PG	1980 08 06.33264	22 51 04.89	-03 30 16.2		688
1980 PG	1980 09 07.35417	22 21 07.54	-02 58 01.5		688
1980 PG	1980 09 17.32014	22 11 53.33	-02 58 31.5		688
1980 PG	1980 10 02.25243	22 01 29.69	-02 56 57.1		688
1980 PG	1980 10 04.15069	22 00 33.49	-02 56 07.0	17.2	688
1980 PJ	1980 10 02.13750	22 09 22.13	-11 51 02.9	17.2	688
1980 PM	1980 07 17.37222	22 59 02.00	-07 21 19.8	17.0	688
1980 PM	1980 07 19.34722	22 59 22.83	-07 34 00.6		3 688
1980 PM	1980 09 04.33125	22 41 09.09	-16 19 48.8		3 688
1980 PM	1980 10 02.18889	22 25 40.98	-20 44 40.5		688
1980 PM	1980 10 02.22986	22 25 40.28	-20 44 55.7	16.8	688
1980 PN	1980 07 17.37222	23 05 07.30	-06 39 10.2	17.2	688
1980 PN	1980 07 19.34722	23 05 04.13	-06 40 41.1		688
1980 PN	1980 10 08.22569	22 21 30.10	-11 30 19.6	16.8	688
1980 PZ	1980 10 02.25243	22 13 11.08	-01 50 07.4		1 688
1980 PZ	1980 10 05.18750	22 12 18.99	-01 46 33.0	17.2	688
1980 PA1	1980 10 02.25243	22 18 04.34	-03 04 55.4		688
1980 PA1	1980 10 05.18750	22 16 53.60	-03 03 23.6	16.5	688
1980 RA	1980 10 02.15486	21 46 29.82	-03 40 55.3	16.5	688
1980 RB	1980 10 02.18889	22 05 04.38	-21 26 53.3	16.8	688
1980 RH	1980 07 19.34722	22 41 36.64	-07 46 10.3	16.5	688
1980 RH	1980 08 08.31250	22 33 44.03	-08 56 43.5	15.5	688
1980 RH	1980 08 08.34792	22 33 42.48	-08 56 54.7		688
1980 RH	1980 09 02.24861	22 13 46.50	-11 24 16.4		688
1980 RH	1980 09 04.31319	22 12 07.65	-11 35 59.3		688
1980 RH	1980 09 07.33160	22 09 49.85	-11 52 17.8		688
1980 RH	1980 09 11.25208	22 07 05.20	-12 11 47.8		1 688
1980 RH	1980 10 02.13750	21 58 59.19	-13 14 18.0	16.8	688
1980 RJ	1980 10 02.13750	21 53 26.54	-14 39 52.5	17.0	688
1980 RK	1980 09 11.25208	22 10 00.91	-12 03 38.1		1 688
1980 RK	1980 10 02.13750	22 02 29.14	-10 22 56.2	17.0	688
1980 RP	1980 10 02.25243	22 00 20.36	-07 50 34.4		688
1980 RQ	1980 07 17.37222	22 58 34.35	-08 31 55.0	16.2	688
1980 RQ	1980 10 02.25243	22 05 45.78	-08 19 49.0		688
1980 RR	1980 10 02.13750	22 03 09.78	-14 04 36.4	16.5	688
1980 RU	1980 10 02.25243	22 18 40.52	-08 35 00.2		688
1980 RU	1980 10 04.18542	22 17 33.11	-08 25 38.0	17.0	2 688
1980 RU	1980 10 08.19722	22 15 36.13	-08 05 22.7	17.2	3 688
1980 RV	1980 09 07.29722	22 08 38.86	-02 31 35.4		688
1980 RX	1980 07 17.33056	23 00 12.30	-03 37 07.1		688
1980 RX	1980 07 17.37222	23 00 11.83	-03 37 00.7	16.5	688
1980 RX	1980 08 06.33264	22 52 19.28	-02 55 29.9		688
1980 RX	1980 09 07.29722	22 27 00.39	-03 15 49.9		688
1980 RX	1980 09 17.32014	22 19 10.41	-03 32 29.7		688
1980 RX	1980 09 17.34236	22 19 09.30	-03 32 30.8	16.8	9 688
1980 RX	1980 10 02.25243	22 10 35.34	-03 52 34.3		688
1980 RY	1980 10 02.25243	22 14 36.96	-04 12 52.9		688
1980 RA1	1980 10 08.25278	23 12 17.78	-13 43 26.7	16.8	688
1980 RN1 *	1980 09 07.29722	22 06 57.38	+00 08 50.1	16.5	4 688
1980 RN1	1980 09 17.32014	22 02 13.20	-01 48 05.5	16.5	688
1980 RN1	1980 09 17.34236	22 02 12.70	-01 48 20.3	16.5	2 688
1980 RN1	1980 10 02.25243	21 59 13.47	-04 30 23.3		688
1980 RN1	1980 10 04.15069	21 59 16.08	-04 48 46.1	17.0	688
1980 RO1	1980 09 14.33056	23 10 45.34	-06 23 10.6		688
1980 RO1 *	1980 09 14.35764	23 10 44.04	-06 23 15.3	16.0	5 688
1980 RP1	1980 09 14.33056	23 13 03.70	-02 19 28.9		688
1980 RP1 *	1980 09 14.35764	23 13 02.31	-02 19 33.4	15.5	5 688
1980 RQ1	1980 09 14.33056	23 19 09.45	-02 11 05.1		688

1980 RQ1	*	1980 09 14.35764	23 19 07.90	-02 11 15.0	16.2	8	688
1980 RR1		1980 09 14.33056	23 21 42.87	-03 16 19.3			688
1980 RR1	*	1980 09 14.35764	23 21 41.56	-03 16 28.6	16.0	5	688
1980 RS1		1980 09 14.33056	23 23 06.25	-04 15 32.0			688
1980 RS1	*	1980 09 14.35764	23 23 04.56	-04 15 32.2	16.5	5	688
1980 TB	*	1980 10 10.22222	23 40 11.53	-15 14 22.3	16.8	4	688
1980 TB		1980 10 10.25208	23 40 10.61	-15 14 30.7			688
1980 VF	*	1980 11 06.09236	00 51 05.63	+00 55 13.0	16.8	5	688
1980 VF		1980 11 06.13333	00 51 03.85	+00 55 17.4			688
1980 VF		1980 11 09.16742	00 49 00.93	+01 01 16.1	16.8		688
1980 VF		1980 11 09.20139	00 48 59.49	+01 01 20.0			688
1980 VF		1980 11 11.13750	00 47 48.58	+01 05 47.7			688
1980 VF		1980 11 11.20764	00 47 45.94	+01 05 55.9			688
1980 VG	*	1980 11 06.11319	00 40 29.83	+18 45 04.5	16.5	5	688
1980 VG		1980 11 06.15417	00 40 28.67	+18 44 53.3			688
1980 VH	*	1980 11 08.13264	00 54 50.12	+17 21 21.3	17.2	4	688
1980 VH		1980 11 08.17083	00 54 49.21	+17 21 00.4			688
1980 VH		1980 11 11.23056	00 54 02.24	+16 55 23.7	17.0		688
1980 VH		1980 11 11.27639	00 54 01.45	+16 54 58.7			688
1980 VJ	*	1980 11 08.13264	00 56 30.02	+15 37 35.3	15.8	4	688
1980 VJ		1980 11 08.17083	00 56 28.87	+15 37 17.4			688
1980 VJ		1980 11 11.23056	00 55 16.28	+15 15 42.0	15.8		688
1980 VJ		1980 11 11.27639	00 55 15.22	+15 15 23.1			688
1980 VK	*	1980 11 08.22014	02 46 11.50	+08 48 53.9	16.5	4	688
1980 VK		1980 11 08.24792	02 46 09.91	+08 48 52.1			688
1980 VL	*	1980 11 08.22014	02 51 04.54	+09 32 22.8	16.2	4	688
1980 VL		1980 11 08.24792	02 51 03.20	+09 32 13.4			688
1980 VM	*	1980 11 09.23611	01 57 23.49	+13 25 25.3	17.2	7	688
1980 VM		1980 11 09.27014	01 57 22.11	+13 25 16.6			688
1980 VN	*	1980 11 09.23611	01 58 42.42	+11 18 45.5	16.2	4	688
1980 VN		1980 11 09.27014	01 58 40.70	+11 18 48.1			688
1980 VN		1980 11 13.12083	01 55 31.21	+11 23 07.6	16.5		688
1980 VN		1980 11 13.13750	01 55 30.47	+11 23 09.2			688
1980 VN		1980 11 14.22778	01 54 39.02	+11 24 29.7	16.8		688
1980 VN		1980 11 14.26806	01 54 37.06	+11 24 33.5			688
1980 VO	*	1980 11 09.23611	02 00 12.35	+13 14 20.9	15.5	4	688
1980 VO		1980 11 09.27014	02 00 10.47	+13 14 40.2			688
1980 VO		1980 11 13.12083	01 57 00.84	+13 44 10.2	16.2		688
1980 VO		1980 11 13.13750	01 57 00.05	+13 44 18.5			688
1980 VO		1980 11 14.22778	01 56 10.80	+13 52 41.8	16.0		688
1980 VO		1980 11 14.26806	01 56 08.79	+13 53 00.4			688
1980 VP	*	1980 11 09.25347	03 04 49.28	+03 27 17.8	16.5	4	688
1980 VP		1980 11 09.28750	03 04 47.43	+03 27 15.8			688
1980 VQ	*	1980 11 09.25347	03 08 24.41	+04 30 08.6	17.5	7	688
1980 VQ		1980 11 09.28750	03 08 22.39	+04 30 08.9			688
1980 VR	*	1980 11 09.31250	03 49 57.96	+23 42 18.9	17.0	4	688
1980 VR		1980 11 09.34722	03 49 56.20	+23 42 03.8			688
1980 VS	*	1980 11 09.31250	03 51 00.60	+25 18 17.7	17.0	4	688
1980 VS		1980 11 09.34722	03 50 58.43	+25 18 12.1			688
1980 VT	*	1980 11 09.31250	03 52 43.09	+22 31 48.2	16.8	4	688
1980 VT		1980 11 09.34722	03 52 41.13	+22 31 42.2			688
1980 VU	*	1980 11 11.23056	00 54 38.23	+17 25 11.0	17.0	4	688
1980 VU		1980 11 11.27639	00 54 37.01	+17 24 49.9			688
7631 P-L		1980 11 06.18472	01 21 57.72	+03 41 30.8	16.8		688
7631 P-L		1980 11 06.22153	01 21 56.18	+03 41 24.2			688

Note 1: right ascension uncertain. 2: declination uncertain. 3 = 1 + 2.

4: discoverer Bowell. 5: discoverer Skiff. 6: correction to MPC 5483.

7 = 3 + 4. 8 = 3 + 5. 9 = 3 + 6.

## OBSERVATIONS MADE AT THE YERKES OBSERVATORY BY Y. C. CHANG AND G. VAN BIESBROECK. FROM ASTRON. J. 80, 735, 1975.

Object	Date	UT	R. A. (1950)			Decl.		Obs.
1928 UF	1928 10	25.38406	02 55 21.21	+13 16	50.6		754	
1928 UF	1928 11	05.17781	02 46 54.48	+12 47	14.3		754	
1928 UF	1928 11	06.22926	02 46 03.60	+12 44	20.6		754	
1928 UF	1928 11	13.18568	02 40 29.83	+12 26	36.8		754	
1928 WC	1928 11	23.35812	02 33 10.45	+12 06	00.5		754	
1928 WC	1928 12	05.17628	02 27 01.72	+11 55	29.0		754	
1928 WC	1928 12	06.10697	02 26 41.07	+11 55	22.6		754	
1928 WC	1928 12	10.14098	02 25 25.39	+11 56	03.5		754	

## OBSERVATIONS MADE AT THE GOETHE LINK OBSERVATORY, MEASURED AND REDUCED AT INDIANA UNIVERSITY.

Object	Date	UT	R. A. (1950)			Decl.		N Obs.
637	1955 10	20.17363	01 14 23.13	+08 03	56.9		760	
637	1955 10	20.21461	01 14 21.31	+08 03	45.4		760	
705	1951 01	06.08509	00 51 20.14	+25 57	19.3		760	
705	1951 01	06.13372	00 51 22.04	+25 57	23.9		760	
1844	1959 04	15.30556	12 53 12.22	+13 28	13.7		3 760	
1844	1959 04	15.33610	12 53 10.51	+13 28	15.5		3 760	
1976	1959 04	16.34255	14 16 08.56	-09 40	14.8		1 760	
2271	1965 03	31.17080	12 30 00.34	+01 10	38.0		760	
2271	1965 03	31.21316	12 29 58.21	+01 10	54.3		760	
2297	1959 03	08.23125	09 54 45.78	+13 13	56.3		760	
2297	1959 03	08.30207	09 54 42.71	+13 14	11.1		760	
1950 LU	1950 06	15.23688	15 39 40.46	-23 40	15.2		760	
1951 AR	1951 01	09.29311	07 39 17.00	+20 15	27.9		760	
1951 AR	1951 01	09.35144	07 39 13.96	+20 15	37.0		760	
1951 CD	1951 02	10.31949	09 19 18.01	+11 35	49.0		760	
1951 CG	1951 02	10.17433	09 35 54.89	+15 06	41.4		760	
1951 CG	1951 02	10.21879	09 35 52.42	+15 07	08.2		760	
1951 CJ	1951 02	10.17433	09 30 06.46	+14 26	10.9		760	
1951 CJ	1951 02	10.21879	09 30 03.48	+14 26	32.1		760	
1951 CK	1951 02	10.17433	09 29 37.73	+14 55	20.6		760	
1951 CK	1951 02	10.21879	09 29 34.88	+14 55	42.1		760	
1951 CX	1951 02	03.12988	05 26 22.95	+22 42	58.3		760	
1951 CX	1951 02	03.31319	05 26 21.68	+22 42	52.5		760	
1951 CZ	1951 02	03.12988	05 40 18.70	+20 20	36.4		760	
1951 CZ	1951 02	03.31319	05 40 19.77	+20 20	52.4		760	
1951 CA1	1951 02	03.12988	05 30 37.66	+24 11	59.1		760	
1951 DD	1951 02	27.17816	09 39 23.29	+06 52	10.8		760	
1951 DD	1951 02	27.22223	09 39 21.40	+06 52	27.7		760	
1951 EX	1951 03	09.18892	09 59 54.14	+27 43	57.3		760	
1951 EX	1951 03	09.23476	09 59 52.20	+27 44	11.7		760	
1951 EZ	1951 03	09.18892	09 57 02.49	+23 50	53.7		760	
1951 EZ	1951 03	09.23476	09 57 00.62	+23 51	11.1		760	
1951 EA1	1951 03	09.18892	09 51 15.52	+29 08	09.0		760	
1951 EA1	1951 03	09.23476	09 51 13.64	+29 08	13.2		760	
1951 EB1	1951 03	09.18892	09 47 55.36	+30 07	29.2		760	
1951 EB1	1951 03	09.23476	09 47 53.37	+30 07	28.9		760	
1951 EC1	1951 03	09.18892	09 47 27.35	+27 03	21.8		760	
1951 EC1	1951 03	09.23476	09 47 25.28	+27 03	28.5		760	
1951 ED1	1951 03	09.18892	09 40 47.44	+26 40	36.6		760	
1951 ED1	1951 03	09.23476	09 40 45.59	+26 40	42.7		760	
1951 EE1	1951 03	09.18892	09 42 35.81	+28 06	10.7		760	
1951 EE1	1951 03	09.23476	09 42 34.02	+28 06	17.5		760	
1951 EF1	1951 03	09.18892	09 43 05.80	+28 13	06.5		760	

1951 EF1	1951 03 09.23476	09 43 03.71	+28 13 08.3	760
1951 EJ1	1951 03 10.20388	10 17 57.22	+09 01 59.6	760
1951 EJ1	1951 03 10.24481	10 17 55.27	+09 02 09.9	760
1951 EM1	1951 03 10.20388	10 05 25.45	+14 07 58.4	760
1951 EM1	1951 03 10.24481	10 05 23.67	+14 08 12.3	760
1951 EN1	1951 03 10.20388	10 06 02.69	+12 46 58.2	760
1951 EN1	1951 03 10.24481	10 06 00.97	+12 47 09.5	760
1951 JD	1951 05 08.11037	13 38 49.35	+07 49 04.6	760
1951 JD	1951 05 08.14995	13 38 47.93	+07 49 10.1	760
1951 KF	1951 05 25.11942	13 22 25.90	+04 14 01.6	760
1951 KF	1951 05 25.15066	13 22 24.97	+04 13 59.5	760
1951 KG	1951 05 25.11942	13 19 48.69	+10 18 30.5	760
1951 KG	1951 05 25.15066	13 19 48.04	+10 18 23.4	760
1951 KK	1951 05 25.18816	15 55 26.92	-23 48 30.2	760
1951 KK	1951 05 25.21802	15 55 24.65	-23 48 22.4	760
1951 LD	1951 06 01.18846	15 21 19.93	-03 36 10.0	760
1951 LD	1951 06 01.24968	15 21 17.45	-03 35 45.6	760
1951 LF	1951 06 10.31665	18 59 11.50	-23 36 06.4	760
1951 LF	1951 06 10.34030	18 59 11.04	-23 36 08.1	760
1951 LH	1951 06 02.24622	15 45 04.61	-34 38 41.7	760
1951 LH	1951 06 02.27538	15 45 05.38	-34 38 48.0	760
1951 NB	1951 07 03.36595	00 06 28.07	+06 32 05.2	760
1951 NE	1951 07 11.26456	20 14 32.00	-24 05 07.0	760
1951 NE	1951 07 11.29579	20 14 31.03	-24 04 54.4	760
1951 OE	1951 07 30.20183	19 38 47.60	-25 24 56.6	760
1951 OE	1951 07 30.24213	19 38 45.69	-25 25 00.1	760
1951 OF	1951 07 30.24213	19 43 56.94	-23 41 58.1	760
1951 PB	1951 08 04.11281	16 29 48.09	-17 10 35.5	760
1951 PB	1951 08 04.13712	16 29 48.97	-17 10 34.3	760
1951 PC	1951 08 13.27591	22 00 47.32	-27 13 41.2	760
1951 PC	1951 08 13.31488	22 00 45.05	-27 14 00.0	760
1951 QC	1951 08 24.12216	20 43 37.31	-20 34 43.1	760
1951 QC	1951 08 24.14578	20 43 37.76	-20 34 30.2	760
1951 SK	1951 09 30.29442	01 29 26.38	+01 47 45.5	760
1951 SK	1951 09 30.34233	01 29 24.39	+01 46 54.7	760
1951 SL	1951 09 30.29442	01 30 31.67	-01 28 12.8	760
1951 SL	1951 09 30.34233	01 30 30.18	-01 28 39.6	760
1951 TF	1951 10 03.16537	22 34 30.61	-13 56 19.4	760
1951 TF	1951 10 03.21430	22 34 30.13	-13 56 05.2	760
1951 TG	1951 10 03.16537	22 22 49.85	-19 37 15.3	760
1951 TG	1951 10 03.21430	22 22 49.42	-19 37 04.5	760
1951 WC	1951 11 29.21494	02 40 00.42	+18 13 20.2	760
1951 WC	1951 11 29.25728	02 39 58.50	+18 13 06.4	760
1951 WE	1951 11 29.21494	02 29 26.60	+13 24 17.1	760
1951 WE	1951 11 29.25728	02 29 25.37	+13 24 12.6	760
1952 QG1	1952 08 25.30210	23 48 20.87	-07 16 20.5	760
1952 QG1	1952 08 25.32988	23 48 19.83	-07 16 30.8	760
1953 TK1	1953 10 08.20934	01 09 58.89	+08 53 37.1	760
1953 TK1	1953 10 08.25795	01 09 56.20	+08 53 17.5	760
1953 TQ2	1953 10 14.20068	01 16 38.26	+04 00 12.1	760
1953 TQ2	1953 10 14.24859	01 16 35.47	+03 59 58.9	760
1953 TV2	1953 10 14.20068	01 05 15.65	+01 06 58.5	760
1953 TV2	1953 10 14.24859	01 05 12.60	+01 06 48.0	760
1953 UQ	1953 10 18.39232	02 48 47.26	+11 19 50.8	760
1953 UQ	1953 10 18.43189	02 48 45.95	+11 19 34.7	760
1953 UQ	1953 11 05.20696	02 37 59.07	+09 15 09.2	760
1953 UQ	1953 11 05.26876	02 37 56.57	+09 14 46.2	760

1953 VZ	1953 11 05.09656	00 37 00.60	-04 03 31.4	760
1953 VZ	1953 11 05.15004	00 36 58.62	-04 03 28.2	760
1953 VV3	1953 11 10.10138	00 29 22.97	-04 16 09.4	760
1953 VV3	1953 11 10.14652	00 29 23.68	-04 16 18.3	760
1954 LG	1954 06 05.20648	16 13 24.46	-24 13 38.3	760
1954 LG	1954 06 05.25926	16 13 20.94	-24 13 40.5	760
1954 MA	1954 06 24.15611	15 57 20.60	-24 20 37.2	760
1954 MA	1954 06 24.20265	15 57 18.57	-24 20 39.3	760
1954 SL	1954 09 27.15346	23 50 52.90	-02 51 36.2	760
1954 SL	1954 09 27.20346	23 50 51.09	-02 52 21.9	760
1955 EH	1955 03 14.17838	09 50 49.25	+14 05 44.4	760
1955 EH	1955 03 14.21692	09 50 47.79	+14 05 59.8	760
1955 EH	1955 03 23.13054	09 46 41.95	+14 55 03.9	760
1955 EH	1955 03 23.16664	09 46 41.09	+14 55 13.6	760
1955 RA	1955 09 13.09888	21 26 51.29	-02 04 47.7	760
1955 RA	1955 09 13.13845	21 26 49.99	-02 04 59.1	760
1955 RH	1955 09 13.25547	22 56 50.95	-16 00 58.9	760
1955 RH	1955 09 13.29368	22 56 49.21	-16 01 23.5	760
1955 RH	1955 09 21.18327	22 51 18.90	-17 08 04.8	760
1955 RL	1955 09 13.25547	23 02 01.95	-17 44 36.5	760
1955 RL	1955 09 13.29368	23 01 59.95	-17 44 52.1	760
1955 RL	1955 09 18.08536	22 58 07.36	-18 14 34.1	760
1955 RN	1955 09 13.25547	22 56 41.86	-15 37 26.9	760
1955 RN	1955 09 13.29368	22 56 40.32	-15 37 34.8	760
1955 RR	1955 09 18.20166	01 08 56.47	+05 01 32.9	760
1955 RR	1955 09 18.24054	01 08 55.16	+05 01 22.5	760
1955 RB1	1955 09 14.24748	00 19 33.96	+13 39 04.8	760
1955 RB1	1955 09 14.28707	00 19 32.32	+13 38 59.8	760
1955 RE1	1955 09 14.24748	00 08 35.95	+11 50 52.9	760
1955 RE1	1955 09 14.28707	00 08 33.72	+11 50 57.7	760
1955 RE1	1955 09 21.23223	00 02 12.12	+12 00 32.7	760
1955 RE1	1955 09 21.27182	00 02 09.56	+12 00 59.2	760
1955 TG	1955 10 11.17083	23 43 18.17	+13 20 36.9	760
1955 TG	1955 10 11.21388	23 43 16.40	+13 20 19.2	760
1955 TG	1955 10 12.18649	23 42 39.50	+13 14 07.8	760
1955 TG	1955 10 12.22606	23 42 37.69	+13 13 51.2	760
1955 TJ	1955 10 11.17083	00 00 28.85	+11 33 14.7	760
1955 TJ	1955 10 11.21388	00 00 27.36	+11 32 58.6	760
1955 TL	1955 10 11.26526	00 34 41.48	+07 47 44.4	760
1955 TL	1955 10 11.30971	00 34 38.71	+07 47 44.0	760
1955 TL	1955 10 20.11842	00 26 45.65	+07 46 54.8	760
1955 TM	1955 10 11.26526	00 34 26.85	+04 55 47.5	760
1955 TM	1955 10 11.30971	00 34 25.13	+04 55 12.1	760
1955 TM	1955 10 20.07884	00 29 42.86	+02 59 46.3	760
1955 TM	1955 10 20.11842	00 29 41.61	+02 59 15.8	760
1955 VG1	1955 11 10.08751	00 56 32.39	+05 57 16.3	760
1955 VG1	1955 11 10.12362	00 56 31.42	+05 57 06.1	760
1955 XF	1955 12 06.10482	03 46 14.47	+21 31 50.5	760
1955 XF	1955 12 06.14440	03 46 12.61	+21 31 32.9	760
1956 RF	1956 09 05.16703	22 13 49.22	-04 05 48.9	760
1956 RF	1956 09 05.20870	22 13 46.99	-04 06 14.2	760
1957 JD	1957 04 24.83247	14 36 59.19	-13 11 38.0	081
1957 JD	1957 04 24.89774	14 36 55.85	-13 11 27.8	081
1957 JD	1957 05 02.24270	14 31 11.44	-12 49 39.7	760
1957 JD	1957 05 02.28717	14 31 09.14	-12 49 31.8	760
1957 JJ	1957 05 25.20345	14 13 15.08	-07 44 49.3	760
1957 JJ	1957 05 25.24301	14 13 13.39	-07 44 47.0	760

1957 JL	1957 05	02.24270	14 15	22.37	-10 17	32.2	760
1957 JL	1957 05	02.28717	14 15	20.27	-10 17	25.8	760
1957 QD	1957 08	26.30615	00 15	01.33	-06 27	48.1	760
1957 QD	1957 08	26.36014	00 14	59.87	-06 28	16.4	760
1957 QD	1957 09	28.20626	23 55	20.36	-11 19	59.2	760
1957 QD	1957 09	28.34095	23 55	14.91	-11 21	01.3	760
1957 WG	1957 11	17.15352	02 54	32.18	+23 21	29.8	760
1958 BF	1958 01	19.10350	06 46	32.44	+22 49	28.6	760
1958 BF	1958 01	19.14586	06 46	30.46	+22 49	32.0	760
1959 GH	1959 04	15.30556	12 52	37.42	+15 24	12.6	1 760
1959 GH	1959 04	15.33610	12 52	35.66	+15 24	04.5	1 760
1959 GK	1959 04	15.30556	12 44	54.54	+13 15	43.2	1 760
1959 GK	1959 04	15.33610	12 44	52.75	+13 15	38.9	1 760
1959 GL	1959 04	15.30556	12 34	44.43	+13 47	43.5	1 760
1959 GL	1959 04	15.33610	12 34	42.44	+13 47	41.7	1 760
1959 GO	1959 04	16.34255	14 12	54.61	-10 10	40.9	1 760
1959 GO	1959 04	16.38630	14 12	52.97	-10 10	22.9	1 760
1959 NA	1959 07	02.21207	16 31	17.54	-14 11	30.8	760
1959 NA	1959 07	03.15141	16 30	47.74	-14 06	48.7	760
1959 NA	1959 07	03.19408	16 30	46.34	-14 06	28.5	760
1959 NB	1959 07	02.21207	16 20	41.21	-10 51	10.9	760
1959 NB	1959 07	03.15141	16 20	14.47	-10 51	24.6	760
1959 NB	1959 07	03.19408	16 20	13.09	-10 51	25.1	760
1959 NC	1959 07	04.22771	18 59	58.51	-26 28	59.8	760
1959 NC	1959 07	04.27008	18 59	56.41	-26 29	05.3	760
1959 ND	1959 07	04.22771	18 56	16.17	-24 41	59.2	760
1959 ND	1959 07	04.27008	18 56	13.86	-24 42	10.6	760
1959 RO	1959 09	09.21337	22 08	55.10	-04 00	55.0	760
1959 RO	1959 09	09.25676	22 08	53.02	-04 01	05.0	760
1959 RO	1959 09	11.27098	22 07	22.34	-04 12	13.4	760
1959 RO	1959 09	11.31438	22 07	20.35	-04 12	29.0	760
1960 BD	1960 01	31.05893	08 33	59.08	+16 03	11.9	760
1961 TJ1	1961 10	11.06875	23 58	32.39	-03 46	04.2	760
1961 TJ1	1961 10	11.11250	23 58	30.69	-03 46	13.0	760
1962 RN	1962 09	07.26671	00 56	56.74	+07 55	45.6	5 760
1962 RN	1962 09	07.31937	00 56	54.92	+07 55	28.2	5 760
1962 WV	1962 11	26.09371	02 35	31.64	+13 47	05.4	760
1962 WV	1962 11	26.13746	02 35	29.63	+13 47	04.7	760
1963 TB	1963 10	13.10629	01 26	47.05	+06 35	42.6	760
1963 TB	1963 10	13.16844	01 26	43.80	+06 35	12.6	760
1963 TV	1963 10	14.20281	02 35	16.86	+01 04	17.9	760
1963 UG	1963 10	18.18407	01 36	03.96	+04 19	01.0	760
1963 UG	1963 10	18.22643	01 36	01.71	+04 18	52.7	760
1963 UG	1963 10	22.18267	01 32	45.23	+04 05	36.1	760
1963 UG	1963 10	22.22642	01 32	42.88	+04 05	27.4	760
1965 UB	1965 10	28.10556	00 15	13.78	+01 32	31.1	760
1965 UB	1965 10	28.22569	00 15	10.53	+01 32	23.0	760

Note 1: reduced at the Cincinnati Observatory. 2: correction to MPC 4141.

3 = 1 + 2. 4: correction to MPC 2304. 5 = 1 + 4.

OBSERVATIONS MADE AT THE HARVARD COLLEGE OBSERVATORY'S AGASSIZ STATION BY  
R. E. MC CROSKY, C.-Y. SHAO, G. SCHWARTZ, J. H. BULGER AND D. W. E.  
GREEN (ASSISTED BY C. M. BARDWELL, B. G. MARSDEN AND A. C. PORTER).

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1977 XI	1980 09	09.32078	03 28 09.52	+33 37 12.4		801
/1978 XVII	1979 01	05.33844	12 22 55.87	+15 54 41.8		801
/1978h	1978 10	03.02947	16 01 20.95	+03 48 56.6	18.5N	801

/1980e	1980 09 04.09267	17 35 40.47	-04 45 06.2		801
/1980q	1980 11 06.96634	18 05 30.21	+41 37 42.3	10.5T	801
/1980q	1980 11 07.06047	18 05 24.61	+41 34 06.5		801
/1980q	1980 11 07.95432	18 04 35.10	+41 00 52.4		801
/1980q	1980 11 08.96513	18 03 42.81	+40 24 09.8		801
/1980q	1980 11 16.97964	17 58 37.72	+36 03 35.6		801
274	1980 10 13.04264	23 25 12.45	-09 13 15.9		801
274	1980 10 14.11727	23 24 39.29	-09 15 40.0		801
730	1980 09 12.20488	23 50 31.35	-08 34 14.3	18	801
730	1980 10 05.14840	23 29 09.06	-10 40 07.1		801
730	1980 10 13.10250	23 23 29.44	-11 02 55.7		801
2203	1980 01 13.03730	02 13 41.82	+13 40 40.6		801
2265	1980 01 26.39323	14 26 29.99	+04 52 11.7		801
A915 TA	1980 02 11.16174	05 48 42.60	+16 19 16.8		801
1957 HJ	1979 06 20.25668	17 13 57.61	-20 48 03.8		801
1957 HJ	1980 10 14.06498	22 46 15.32	+03 23 08.8		801
1957 HJ	1980 11 01.15042	22 43 50.64	+02 07 25.7		801
1957 HJ	1980 11 03.13014	22 43 59.78	+02 01 21.2		801
1961 RA	1980 10 13.22574	01 09 19.96	+08 08 16.1		801
1962 HD	1980 10 13.21758	00 06 16.64	-06 10 31.7		801
1964 VD	1980 10 13.16716	23 48 15.30	+03 06 52.5		801
1971 QX1	1980 06 06.13740	13 38 28.14	+02 44 23.2		801
1974 OS	1980 10 13.25295	01 04 00.36	+21 32 29.0		801
1974 TA1	1980 11 01.01094	21 52 56.01	-13 21 19.2		801
1976 GU2	1980 10 31.26265	01 57 51.58	+08 12 36.6		801
1976 GU2	1980 11 03.25829	01 55 50.99	+08 05 39.0		801
1976 GU2	1980 11 06.15595	01 53 57.32	+07 59 20.3		801
1976 TA	1980 11 01.26073	02 08 30.86	+13 46 59.9		801
1977 VD	1980 09 12.20488	23 48 40.84	-08 36 56.5	16	801
1977 VD	1980 10 11.04096	23 21 47.81	-09 52 40.1		801
1977 VD	1980 10 13.07274	23 20 27.23	-09 52 44.4		801
1977 VD	1980 10 14.09507	23 19 49.12	-09 52 29.7		801
1979 FK	1980 08 08.12139	17 24 44.04	+00 49 50.4		801
1979 FK	1980 09 12.03663	17 35 17.00	-02 48 10.8		801
1980 PA	1980 11 06.41610	07 56 59.45	+25 12 10.6		801
1980 RJ1	1980 10 13.04264	23 24 28.35	-09 11 10.0		801
1980 RJ1	1980 10 14.11727	23 23 50.30	-09 11 04.4		801
1980 RJ1	1980 10 28.05207	23 18 04.47	-08 53 34.6		801
1980 RJ1	1980 11 03.16935	23 17 02.64	-08 36 52.7		801
1980 SR *	1980 09 19.31861	00 08 52.00	+01 45 19.9	17	801
1980 SR	1980 09 20.10417	00 08 15.48	+01 40 23.5		801
1980 TA *	1980 10 11.04096	23 21 21.43	-09 42 44.0	18	801
1980 TA	1980 10 13.07274	23 20 16.67	-09 52 47.6		801
1980 TA	1980 10 14.09507	23 19 46.43	-09 57 24.9		801
1980 UA *	1980 10 31.26265	01 57 26.69	+08 07 36.9	17	801
1980 UA	1980 11 03.25829	01 54 57.20	+07 57 37.5		801
1980 UA	1980 11 06.15595	01 52 37.39	+07 48 36.8		801
1980 VC *	1980 11 03.25829	01 55 25.37	+07 58 28.3	18	801
1980 VC	1980 11 06.15595	01 52 49.76	+07 56 21.9		801
1980 VD *	1980 11 03.25829	01 56 07.59	+07 54 08.4	18	801
1980 VE *	1980 11 06.15595	01 51 48.64	+08 00 26.8	17.5	801
2524 P-L	1980 09 19.31861	00 08 50.07	+02 04 06.4		801
2524 P-L	1980 09 20.10417	00 08 14.90	+01 57 59.1		801
2524 P-L	1980 10 13.14021	23 51 38.68	-00 59 37.9		801
2524 P-L	1980 11 03.20042	23 45 25.72	-02 35 55.2		801
6521 P-L	1980 08 13.13711	20 25 33.27	-16 47 13.5		801
6521 P-L	1980 09 04.15135	20 11 13.72	-18 30 15.5		801



## OBSERVATIONS MADE AT TOKAI BY T. FURUTA. COMMUNICATED BY T. URATA.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1980q	1980 11 08.39618		18 04 12.01	+40 44 46.3	11 T	879
/1980q	1980 11 08.40503		18 04 11.32	+40 44 27.2		879
/1980q	1980 11 09.41285		18 03 20.83	+40 08 11.5		879
/1980q	1980 11 09.41979		18 03 20.52	+40 07 55.1		879
1980 VA *	1980 11 08.55747		02 50 49.31	+09 30 36.2	16	879
1980 VA	1980 11 08.57049		02 50 48.78	+09 30 31.4		879
1980 VA	1980 11 09.53090		02 50 06.50	+09 25 28.0		879

## OBSERVATIONS MADE AT SENDAI MUNICIPAL OBSERVATORY BY M. KOISHIKAWA, T. KOYAMA AND EDAMATSU. FROM NIHONDAIRA OBS. CIRC. NOS. 1149 AND 1151.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1980g	1980 09 14.74653		04 07 54.20	-00 09 36.4		893
/1980g	1980 09 14.76980		04 07 56.38	-00 09 30.2	13.5T	893
/1980g	1980 09 14.78021		04 07 57.60	-00 09 27.2		893
/1980g	1980 09 14.78681		04 07 58.16	-00 09 26.7		893
1974 OS	1980 10 04.63097		01 11 13.72	+22 01 26.5	15.5	893
1974 OS	1980 10 04.68265		01 11 11.58	+22 01 21.7		893
1974 OS	1980 10 07.60278		01 08 46.58	+21 52 52.7		893
1974 OS	1980 10 07.68264		01 08 42.22	+21 52 38.5		893

## OBSERVATIONS MADE AT WOOLSTON BY H. B. RIDLEY, A. GRIFFITHS AND R. L. WATERFIELD. MEASURED BY WATERFIELD AND P. BIRTWHISTLE.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1977 XI	1980 10 04.97640		04 42 54.88	+47 31 52.8	13.5T	1	993
/1980h	1980 11 03.02192		09 59 25.43	+41 45 55.6	9.0T	2	993
/1980q	1980 11 12.79399		18 00 55.30	+38 13 07.2	9.5T	3	993

Note 1: coma very diffuse with very little condensation, total diameter 2'.5; no sign of tail. 2: strongly condensed inner coma of diameter 1', outer coma of diameter 4' slightly elongated to the south; no definite tail. 3: strongly condensed inner coma of diameter 1', perfectly circular outer coma of diameter 2'.5; no tail.

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## ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers and authors of double designations are B = C. M. Bardwell, E = E. Bowell, M = B. G. Marsden, W = J. G. Williams. For further information see MPC 4499.

Planet	B(1,0)	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
A919 SA	14.5	190919	352.95	17.69	349.64	4.23	0.2325	2.2812	10 4			B
1976 QL	14.5	760919	25.33	344.93	309.00	5.57	0.3135	2.7407	31 5			W
1976 QM	13.5	760830	24.00	1.68	296.31	1.81	0.1969	3.0873	3 4			B
1976 QN	16.0	760830	30.27	275.70	17.76	0.14	0.1493	2.1711	3 4			B
1976 QP	15.0	760830	16.79	90.20	219.93	1.87	0.1937	2.5627	3 4			B
1976 QR	13.5	760919	318.23	239.12	160.63	14.23	0.1878	2.6210	31 6	1		W
1976 QS	15.7	760919	5.82	4.16	331.31	6.02	0.2538	2.2407	31 6	1		W
1976 QV	14.5	760919	346.04	60.39	298.07	3.16	0.0752	2.3162	29 4	1		W
1976 QX	13.2	760919	306.59	53.33	349.08	1.38	0.0916	2.8888	29 4	1		W
1980 LP	14.5	800610	303.57	225.06	105.77	6.74	0.1788	2.3383	10 8			M
1980 LU	16.0	800610	339.52	122.53	165.98	3.12	0.2107	2.4594	8 4			B
1980 LY	16.5	800610	343.04	180.39	101.37	4.34	0.1682	2.1411	10 5			B
1980 LB1	13.5	800610	256.46	154.20	213.56	9.01	0.0713	3.0625	10 5			B
1980 LC1	15.5	800610	315.51	230.82	99.21	13.26	0.2864	2.5922	9 5			B

1980 LE1	14.5	800610	9.96	7.43	239.60	11.99	0.1005	2.5899	10 6	B
1980 MD	12.5	800610	196.45	310.03	110.95	10.35	0.1271	3.2633	10 7	B
1980 OD	13.5	800809	331.01	233.08	142.32	10.47	0.2385	3.0207	77 7	M
1980 OF	13.5	800809	0.70	18.84	312.44	10.17	0.1595	3.1118	79 8	E
1980 PF	15.0	800809	359.05	17.36	312.05	8.31	0.1622	2.2626	77 6	E
1980 PG	13.2	800809	285.86	95.17	324.27	16.23	0.1066	2.7671	79 9 1	E
1980 PJ	15.3	800829	7.16	330.51	353.47	3.40	0.2047	2.3083	55 5	E
1980 PM	13.8	800809	321.83	242.72	141.81	14.11	0.1843	2.6060	77 7	E
1980 PP	13.0	800829	167.16	237.30	272.94	8.80	0.0522	3.0195	28 0	M
1980 PZ	15.0	800829	15.14	353.32	322.52	10.07	0.1901	2.4458	51 0	M
1980 PA1	13.3	800829	14.64	353.82	325.51	10.34	0.1471	2.6189	51 0	M
1980 RA	15.0	800918	323.84	78.71	337.05	21.39	0.3623	2.3740	55 9	M
1980 RB	15.0	800918	5.44	224.03	107.74	4.92	0.3058	2.3950	77 6	M
1980 RJ	14.8	800829	305.68	48.85	354.17	6.53	0.1485	2.2246	30 3	E
1980 RK	15.5	800829	356.78	356.61	343.21	6.15	0.2637	2.3868	30 6	E
1980 RP	13.6	800829	8.85	345.77	335.40	17.03	0.2138	3.1183	55 8	E
1980 RQ	13.0	800829	29.83	324.03	331.72	8.58	0.1528	2.7243	77 0	M
1980 RR	13.1	800829	318.19	36.33	348.54	12.91	0.1061	2.7925	30 4	E
1980 RU	14.1	800918	338.61	27.98	344.45	15.39	0.1395	2.5757	30 4	E
1980 RX	12.7	800809	358.50	17.32	318.13	10.26	0.0898	3.0437	77 9	E
1980 RN1	13.9	800918	346.82	178.96	185.95	13.23	0.2708	3.0377	27 5	E
1980 RX1	15.0	800918	332.88	255.37	141.99	4.34	0.1559	2.2435	19 6	M
1980 SD	15.0	800918	45.57	279.23	19.03	12.58	0.1784	2.5864	19 0	M
1980 SF	16.5	800918	358.79	212.29	155.60	2.37	0.2166	2.3459	19 6	M
1980 SG	15.0	800918	6.74	335.91	21.84	6.69	0.1717	2.4263	19 8	M
1980 SH	15.0	800918	309.71	245.96	180.26	23.19	0.0999	1.9188	19 6	M
1980 SJ	15.0	800918	353.32	135.42	232.97	5.20	0.1350	2.4107	4 6	M
1980 SK	16.0	800918	349.33	35.51	340.13	7.54	0.2154	2.1663	4 6 2	M
1980 SM	15.0	800918	345.72	43.47	339.31	8.71	0.2162	2.6428	4 6	M
1980 SO	13.5	800918	13.96	348.16	352.66	13.93	0.1637	2.4561	4 6	M
1980 SP	14.0	800918	313.68	123.44	292.75	4.21	0.0987	2.2878	4 6	M
1980 SQ	15.5	800918	342.17	159.65	224.17	4.55	0.1405	2.1941	4 6	M
1980 TA	14.5	801008	206.95	0.39	152.77	6.49	0.0112	2.2158	3 3 2	M
1980 TF	14.0	801008	356.69	243.82	125.27	1.99	0.0989	3.2030	3 6 2	M
1980 TG	16.5	801008	44.48	164.62	137.07	2.15	0.2202	2.1992	3 6 2	M
1980 UA	14.0	801028	17.11	294.36	78.50	3.22	0.0592	2.8388	6 3	B
1980 VN	12.5	801028	31.02	313.46	38.27	16.49	0.1587	3.3694	5 6	E
1980 VO	15.0	801028	2.70	350.70	38.32	9.47	0.3137	2.4643	5 6	E
3537 P-L	13.1	600923	66.15	347.50	302.93	7.04	0.1171	2.6666	9 7	M

Note 1: double designations 1976 QR = 1976 SX (W), 1976 QS = 1976 SW (W),  
 1976 QV = 1976 SV (W), 1976 QX = 1976 SY (W), 1980 PG = 1980 SA (E).  
 2: e assumed.

\* \* \* \* \*

ORBITAL ELEMENTS BY G. SITARSKI, POLISH ACADEMY OF SCIENCES.

Periodic Comet Swift-Gehrels

Epoch 1981 Nov. 12.0 ET = JDE 2444920.5

T 1981 Nov. 27.2669 ET

q	1.361128	(1950.0)	P	Q
n	0.1064581	Peri. 84.5408	+0.77250525	-0.62442235
a	4.409103	Node 314.0339	+0.50019955	+0.71038131
e	0.691291	Incl. 9.2422	+0.39119821	+0.32473853
P	9.26			

From 39 observations 1889-1973.

## ORBITAL ELEMENTS BY D. K. YEOMANS, JET PROPULSION LABORATORY.

Periodic Comet Finlay

Epoch 1981 June 25.0 ET = JDE 2444780.5

T 1981 June 20.00081 ET

q	1.1009272	(1950.0)	P	Q	
n	0.14130849	Peri.	322.12934	+0.99682098	-0.06748848
a	3.6505409	Node	41.80145	+0.07925729	+0.89423389
e	0.6984208	Incl.	3.64251	-0.00813732	+0.44248283
P	6.97				

From 31 observations 1960-1974, mean residual 1".1. Nongravitational parameters A1 = +0.29, A2 = +0.0202.

\* \* \* \* \*

## ORBITAL ELEMENTS BY B. G. MARSDEN, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

The identifications are by B. G. Marsden unless otherwise stated.

Periodic Comet Russell 1 (1979d)

Epoch 1979 May 7.0 ET = JDE 2444000.5

T 1979 May 26.97918 ET

q	1.6134398	(1950.0)	P	Q	
n	0.16152354	Peri.	0.22932	-0.63758299	+0.71132812
a	3.3392236	Node	230.17649	-0.70738855	-0.69264083
e	0.5168219	Incl.	22.65315	-0.30510550	+0.11941933
P	6.10				

From 9 observations 1979 Feb. 27-Aug. 14, mean residual 1".3.

Comet Torres (1979e)

Epoch 1979 July 26.0 ET = JDE 2444080.5

T 1979 July 15.40264 ET

q	4.6869157	(1950.0)	P	Q	
z	-0.0002261	Peri.	10.10681	+0.36960786	-0.10151742
	+/-0.0000137	Node	292.43822	-0.90692433	-0.25570299
e	1.0010596	Incl.	92.17521	-0.20218379	+0.96141052

From 29 observations 1978 Aug. 23-1979 Oct. 23, mean residual 1".2.

Comet Torres (1980e)

T 1980 Apr. 19.88348 ET

q	2.5839824	(1950.0)	P	Q	
		Peri.	334.98105	+0.01781612	+0.32449517
		Node	278.82281	-0.67772692	-0.69149776
e	1.0	Incl.	73.14545	-0.73509781	+0.64539424

From 22 observations 1980 June 13-Sept. 4.

Periodic Comet Russell 2 (1980o)

T 1980 May 19.54788 ET

q	2.1605899	(1950.0)	P	Q	
n	0.13838019	Peri.	245.44682	+0.32517400	+0.93336717
a	3.7018610	Node	44.45127	-0.76995199	+0.35460396
e	0.4163503	Incl.	12.53125	-0.54903170	+0.05551357
P	7.12				

From 5 observations 1980 Aug. 9-Oct. 6.

## Comet Cernis-Petrauskas (1980k)

T 1980 June 22.44093 ET

q	0.5232492	(1950.0)	P	Q
	Peri.	337.81539	-0.78484012	-0.56283863
	Node	159.92822	+0.61821481	-0.68218586
e	1.0	Incl.	49.07386	-0.04285351
				+0.46672811

From 11 observations 1980 Aug. 2-Sept. 7.

## Comet Meier (1980q)

T 1980 Dec. 9.35168 ET

q	1.5218508	(1950.0)	P	Q
	Peri.	87.78128	+0.11524221	-0.90404790
	Node	24.79259	-0.53444390	-0.40570799
e	1.0	Incl.	101.01996	+0.83731054
				-0.13453035

From 18 observations 1980 Nov. 6-17.

## Comet Russell (1980l)

T 1981 Mar. 6.20889 ET

q	2.1138783	(1950.0)	P	Q
	Peri.	297.14399	+0.15842059	-0.77198487
	Node	232.07099	-0.36759173	-0.62475218
e	1.0	Incl.	128.69994	-0.91639469
				+0.11714978

From 7 observations 1980 Sept. 6-Oct. 1.

## Periodic Comet Gehrels 2 (1973 XI)

Epoch 1981 Nov. 12.0 ET = JDE 2444920.5

T 1981 Nov. 18.66739 ET

q	2.3616413	(1950.0)	P	Q
n	0.12354858	Peri.	183.46395	+0.77740603
a	3.9924934	Node	215.53397	-0.62537417
e	0.4084796	Incl.	6.66269	+0.57982040
				+0.75404996
P	7.98			+0.24381992
				+0.20078793

From 35 observations 1973 Sept. 29-1975 Mar. 7, mean residual 1".0.

(1198) Atlantis = 1958 RQ = 1975 TQ4 = 1975 VX6

The key identifications (1198) = 1975 TQ4 = 1975 VX6 are by O. Kippes.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 276.19777	(1950.0)	P	Q
n	0.29175671	Peri.	83.76463
a	2.2514146	Node	259.49899
e	0.3346615	Incl.	2.72405
			-0.07115188
P	3.38	B(1,0)	16.0
			+0.95653539
			-0.28280287
			+0.87654090
			+0.38577151

Residuals in seconds of arc

310907	024(11.4-	1.6-)	311003	008	0.7-	1.5-	311201	024	0.9+	0.0	
310909	024(20.6-	22.2-)	311004	024	1.3-	0.4+	580910	690	0.6-	0.5+	
310914	024	0.4+	0.3+	311009	754	1.0-	1.0-	580911	690	0.7-	0.5+
310915	024	1.3+	0.3+	311012	754	(1.0-	8.2-)	751014	095	1.2+	1.2+
310916	024	1.7+	0.4+	311102	024	1.7-	1.3-	751106	095	1.5-	0.9+

(1627) Ivar

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 154.35417	(1950.0)	P	Q
n	0.38745406	Peri.	167.29780
a	1.8634707	Node	132.70109
e	0.3967906	Incl.	8.44194
			-0.31432090
P	2.54	B(1,0)	14.2
			+0.50173402
			+0.85826743
			+0.50910901
			+0.06469184

From 186 observations 1929-1980, mean residual 1".1.

(1862) Apollo

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	162.40763	(1950.0)		P		Q
n	0.55281516	Peri.	285.45440	+0.77258556		+0.63165636
a	1.4703343	Node	35.44334	-0.53174760		+0.69898841
e	0.5598863	Incl.	6.35632	-0.34692368		+0.33529903
P	1.78	B(1,0)	17.0			

From 44 observations 1973-1980, mean residual 1".8.

(1865) Cerberus

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	134.85174	(1950.0)		P		Q
n	0.87803207	Peri.	325.05142	-0.98699989		-0.06109228
a	1.0800963	Node	212.43431	+0.08604151		-0.98208122
e	0.4670082	Incl.	16.09158	-0.13575002		-0.17828123
P	1.12	B(1,0)	17.6			

From 53 observations 1971-1980, mean residual 1".2.

(2298)\* A915 TA = 1975 VE1

Discovered 1915 Oct. 2 by M. Wolf at Heidelberg.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	239.86227	(1950.0)		P		Q
n	0.26388341	Peri.	146.47621	+0.96407551		+0.26413326
a	2.4072876	Node	198.27101	-0.25914078		+0.91196310
e	0.1709795	Incl.	5.15020	-0.05834780		+0.31393776
P	3.74	B(1,0)	16.0			

Residuals in seconds of arc

150910	024	3.5-	3.6-	151015	029	4.5-	0.3+	800121	801	0.3+	0.1-
151002	024	2.3+	1.4+	751101	095	0.0	1.0-	800125	801	0.4-	1.9-
151010	024	3.2+	0.8-	751107	095	0.2+	3.0+	800209	801	0.1-	0.4-
151014	045	2.3+	0.6+	751202	095	0.5-	0.2+	800211	801	0.1+	0.5-

(2299)\* 1941 SZ = 1941 SH1 = 1966 UP = 1970 PQ

Discovered 1941 Sept. 25 by Y. Vaisala at Turku. The key identification 1941 SZ = 1970 PQ is by J. Lehtinen (MPC 5032). The double designation 1941 SZ = 1941 SH1 is by G. Kulin (BZ 23, 135).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	220.79522	(1950.0)		P		Q
n	0.23662051	Peri.	165.88763	+0.93878464		+0.34436854
a	2.5888156	Node	173.94278	-0.32429388		+0.89284361
e	0.2963571	Incl.	5.26345	-0.11626207		+0.29024228
P	4.17	B(1,0)	14.5			

Residuals in seconds of arc

410920	062	1.8-	2.3+	661020	095	0.7+	1.1-	700909	095	3.6+	3.9+
410925	062	0.2+	1.8-	700809	095	0.0	4.4+	700929	095	4.9-	1.2+
410927	062	1.7+	0.5-	700829	095	0.0	5.5-	791219	801	0.2+	0.7+
410929	094(47.2-	14.1+)X		700831	095	0.2+	2.4-	800117	801	0.2-	0.8+

(2300)\* 1953 TG2 = 1977 VY

Discovered 1953 Oct. 10 at the Goethe Link Observatory, Indiana University. The identification is by T. Urata (NOC 1048).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	275.19372	(1950.0)		P		Q
n	0.20622765	Peri.	358.47331	+0.86589246		-0.49977965
a	2.8372969	Node	31.54061	+0.45935875		+0.77762918
e	0.0795179	Incl.	2.32556	+0.19803988		+0.38146186
P	4.78	B(1,0)	14.0			

## Residuals in seconds of arc

531010	760	0.8-	0.6-	771013	095	2.5+	3.3+	771110	026	2.0-	0.3-
531010	760	0.1-	2.2+	771103	026	0.2-	1.0-	771110	026	0.8-	0.5-
531015	760	2.4+	2.2-	771103	026	0.1-	0.9-	771205	026	3.3+	1.2-
531015	760	3.5+	0.9+	771105	026	1.4-	1.4+	800516	801	0.4-	0.6+
531030	760	0.1+	1.5-	771108	026	0.2-	0.8-	800517	801	0.5+	0.4-
531030	760	4.6-	0.7-	771108	026	0.2-	0.1-	800606	801	0.4-	0.9-
770911	095	0.4-	0.1+	771109	026	1.5-	0.0				
771010	095	2.3+	1.7+	771110	026	1.9-	0.7-				

(2301)\* 1965 WJ = 1955 BC = 1974 MD = 1976 UA4

Discovered 1965 Nov. 20 at the Goethe Link Observatory, Indiana University. The key identification 1965 WJ = 1974 MD is by E. Bowell (MPC 5317).  
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 280.40407		(1950.0)		P		Q
n	0.17642780	Peri.	3.37452	+0.12274528		-0.97167227
a	3.1484106	Node	79.64611	+0.90562380		+0.02642996
e	0.2347744	Incl.	11.84706	+0.40592994		+0.23484985
P	5.59	B(1,0)	12.5			

## Residuals in seconds of arc

550116	760	0.0	0.0	651218	330	0.2+	1.8+	740622	808	0.5+	0.8-
550116	760	1.2-	0.2-	651224	330	1.0+	1.3-	740622	808	0.1+	0.3-
651120	760	1.3+	0.5-	651230	330	1.3-	0.9+	761027	095	1.9-	1.0+
651120	760	1.1+	3.4-	740617	808	0.4+	0.0				
651213	330	0.5+	1.2+	740617	808	1.2-	0.2+				

(2302)\* 1972 TL2 = 1935 BF = 1980 LF

Discovered 1972 Oct. 2 by N. E. Kurochkin at the Crimean Astrophysical Observatory. The key identification 1972 TL2 = 1980 LF is by E. Bowell (MPC 5414).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 25.34741		(1950.0)		P		Q
n	0.22912642	Peri.	68.61943	+0.94465675		-0.28271518
a	2.6449610	Node	307.41932	+0.16431668		+0.84681943
e	0.1947323	Incl.	12.09552	+0.28394304		+0.45052078
P	4.30	B(1,0)	13.0			

## Residuals in seconds of arc

350129	012(77.5-	27.4+)X	721007	095	3.8+	2.0-	800617	688	0.2+	0.7+
350208	012	0.9+	721008	095	0.6+	0.1-	800617	688	0.9-	0.6+
721002	095	1.6-	721008	095(10.7-	0.9-)		800618	688	3.3+	0.4+
721002	095	0.8-	721013	095	0.2-	0.5-	800618	688	0.8+	1.5-
721003	095	3.5-	721014	095	2.1+	0.2-	800705	688	0.1+	0.2-
721004	095	0.9+	721028	095	1.4+	0.9-	800714	801	1.7-	0.3+
721005	095	1.6-	721028	095	0.2-	1.4+	800717	688	0.1+	1.2-
721005	095(47.0-	2.7-)	780306	095	1.8-	3.3-	800717	688	0.1-	1.1-
721006	095	0.7+	800614	688	0.1-	0.4+	800804	688	2.0-	1.4+
721006	095	0.9-	800614	688	0.3+	0.3-	800902	688	1.4+	1.5-

(2303)\* 1979 FK = 1974 FH = 1974 FZ

Discovered 1979 Mar. 24 by P. Wild at Zimmerwald. The double designation 1974 FH = 1974 FZ is by C. M. Bardwell (MPC 4576).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 166.82674		(1950.0)		P		Q
n	0.19006512	Peri.	327.43714	-0.94697435		-0.30982921
a	2.9959491	Node	195.23218	+0.31697455		-0.94418938
e	0.1156323	Incl.	18.90390	-0.05259952		-0.11185822
P	5.19	B(1,0)	13.5			

## Residuals in seconds of arc

740320	095	0.3+	1.7-	790419	026	1.3+	0.7+	800606	801	1.1+	0.5-
740322	805	0.5-	0.2+	790419	026	2.2+	1.4+	800707	801	0.5+	0.5+
740323	805	0.1+	0.7+	790424	026	0.7+	0.7+	800708	801	1.3-	0.6-
790324	026	0.4-	1.6-	790424	026	0.7-	0.6+	800808	801	0.2-	0.8+
790324	026	1.1-	0.6-	800417	801	2.1-	0.3-	800912	801	1.8+	0.9+
790414	026	1.2-	0.3+	800516	801	0.1+	0.7-				

(2304)\* 1979 KB = 1962 JM = 1970 GF1 = 1980 RF1

Discovered 1979 May 18 by A. Mrkos at the Klet Observatory. The identifications 1979 KB = 1962 JM = 1970 GF1 are by D. W. E. Green (MPC 4832). The identification 1979 KB = 1980 RF1 was suggested but was not confirmable before the latter observations were published.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	179.82337		(1950.0)		P		Q
n	0.23351975	Peri.	59.70104		-0.25758056		+0.96414867
a	2.6116821	Node	195.76103		-0.94742061		-0.26498069
e	0.1353044	Incl.	13.58323		-0.18985897		+0.01423277
P	4.22	B(1,0)	13.5				

## Residuals in seconds of arc

620505	760	0.9+	0.1-	790526	046	1.9+	2.2-	790621	046	1.4+	0.3-
620505	760	0.2+	0.0	790526	046	0.0	0.9-	790621	046	0.6+	0.7-
700411	805	0.5-	1.0-	790529	046	0.2+	0.1-	790623	046	0.5+	0.6-
700411	805	0.2-	1.1-	790529	046	0.4-	0.1+	790623	046	2.3+	0.9-
700411	805	0.6-	0.2-	790529	046	0.3-	1.9-	790823	801	1.0+	0.0
790518	046	0.7-	1.1+	790530	046	0.3-	1.6-	790913	801	0.4+	1.2+
790518	046	0.2+	0.0	790530	046	0.7+	0.8-	800908	046	(13.8+	0.8-)
790520	046	1.3-	0.0	790530	046	0.9-	1.3-	800908	046	0.2+	0.7-
790520	046	1.2-	1.4+	790531	046	0.9-	1.6+	801003	046	0.0	0.3-
790521	046	2.0+	0.0	790601	046	0.1+	0.5+	801003	046	1.1-	0.1-
790521	046	0.4-	0.6+	790603	046	1.9-	0.2-	801106	688	0.6+	3.5-
790522	046	0.8-	0.5+	790603	046	0.7+	0.5+	801106	688	0.7+	1.9+
790523	046	0.2-	0.3+	790604	046	0.7-	0.6+				

(2305)\* 1980 RJ1 = 1929 TM = 1931 AJ = 1934 VM = 1941 FO = 1952 SB  
 = 1955 HE = 1966 RE = 1969 FB = 1971 TT = 1976 YK6  
 = 1978 EY4

Discovered 1980 Sept. 12 at the Harvard College Observatory's Agassiz Station. The identification 1980 RJ1 = 1978 EY4 is by C. M. Bardwell.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	40.31170		(1950.0)		P		Q
n	0.21195627	Peri.	352.99170		+0.94960739		-0.30852067
a	2.7859407	Node	25.19438		+0.29350424		+0.81329697
e	0.0312335	Incl.	7.46751		+0.11000483		+0.49331837
P	4.65	B(1,0)	12.5				

## Residuals in seconds of arc (or two decimals in units of degrees)

291001	690(77.0+ 15.5+)Y	410320	062(19.8- 65.7-)X	780306	095	2.4-	0.9+
291005	690(42.1+ 23.7+)X	520916	760(0.03- 0.00-)X	800912	801	(7.0-	5.4+)
291011	690 (2.4+ 0.7+)Y	520926	760(31.8- 4.7+)X	800916	801	0.5+	1.0-
291012	690 (9.1+ 43.7-)Y	550422	760(30.1+ 5.0+)X	800919	801	1.1+	0.4-
310111	690(72.1+ 93.3-)X	660915	095 1.8- 2.3-	801013	801	1.7+	2.6+
310112	690(29.0+ 25.0+)X	690323	095 0.8+ 3.6-	801014	801	0.4+	0.4+
341107	094(36.3- 15.4-)X	711010	095 3.3+ 1.4-	801028	801	1.1-	0.3-
410318	062 (6.6+ 49.9+)X	761220	095 0.5- 0.2+	801103	801	2.6-	0.1-

1940 GN = 1948 NB = 1959 GL

The key identification 1940 GN = 1959 GL is by E. Bowell.

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	252.52097		(1950.0)		P		Q
n	0.25737146	Peri.	166.23862		-0.41536612		+0.89470958
a	2.4477289	Node	79.01159		-0.84958421		-0.31705081
e	0.1875588	Incl.	9.62968		-0.32508099		-0.31460062
P	3.83	B(1,0)	14.0				

Residuals in seconds of arc

400409	062	0.5+	1.2-	400501	062	0.2-	1.7+	590415	760	1.7+	0.9+	
400410	062	3.3-	0.5-	480707	078	(89.4-	10.6-)	X	590415	760	3.1-	1.0-
400413	062	0.7+	0.2+	590406	760	0.2-	0.5+					
400430	062	0.9+	0.7-	590406	760	0.8+	1.0+					

\* \* \* \* \*

ORBITAL ELEMENTS BY C. M. BARDWELL, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

The identifications are by C. M. Bardwell unless otherwise stated.

(2306)\* 1939 PM = 1967 TK = 1971 SC3

Discovered 1939 Aug. 15 by K. Reinmuth at Heidelberg.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	103.03710		(1950.0)		P		Q
n	0.21836803	Peri.	101.43495		+0.92537467		+0.37401248
a	2.7311361	Node	236.62963		-0.37014325		+0.85656671
e	0.0640984	Incl.	4.23104		-0.08170486		+0.35553921
P	4.51	B(1,0)	13.0				

Residuals in seconds of arc

390815	024	1.8-	1.1+	671013	029	0.3+	0.2-	800816	801	0.4+	1.1+
390818	024	1.0+	2.0-	671014	029	0.3+	0.2+	801109	688	0.5-	1.2-
390908	024	1.7+	1.2+	671014	029	0.0	0.6+	801109	688	0.6+	0.9-
390909	024	0.8-	0.4-	710927	095	1.5-	0.5-				
671013	029	0.5-	0.1+	711012	095	1.1+	1.7+				

(2307)\* 1957 HJ = 1977 AH

Discovered 1957 Apr. 18 at La Plata.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	160.85282		(1950.0)		P		Q
n	0.18532793	Peri.	347.47662		-0.51263465		+0.84908389
a	3.0467873	Node	251.55922		-0.77566587		-0.52166460
e	0.0576192	Incl.	7.72544		-0.36816868		-0.08320206
P	5.32	B(1,0)	12.1				

Residuals in seconds of arc

570418	839	1.6+	1.7+	770120	095	0.2+	1.1-	801005	688	0.4+	0.0
570427	839	0.8+	1.6+	790620	801	0.1+	0.7-	801005	688	0.7+	1.4-
570502	839	0.9-	0.0	800816	801	1.2-	1.4+	801014	801	0.3+	0.5+
570523	839	0.5-	0.4-	800904	046	0.3+	1.2+	801101	801	0.4+	1.5+
770113	095	0.2-	2.0+	800904	046	0.5-	0.7+	801103	801	1.7-	0.9-

(2308)\* 1967 JM = 1930 DR = 1972 TX7 = 1976 UH12 = 1980 VF

Discovered 1967 May 6 by C. U. Cesco and A. R. Klemola at the Yale-Columbia Southern Station, El Leoncito, Argentina. The key identification 1967 JM = 1980 VF is by E. Bowell.



Epoch 1981 July 15.0 ET = JDE 2444800.5

M	158.73922		(1950.0)		P		Q
n	0.24275988	Peri.	231.59734	-0.08521179		+0.98668037	
a	2.5449823	Node	34.29386	-0.82015356		+0.00950912	
e	0.1769240	Incl.	14.23688	-0.56576239		-0.16239279	
P	4.06	B(1,0)	13.5				

Residuals in seconds of arc

300227	024	1.1+	1.4+	721006	095	0.4+	1.0+	801109	688	0.7+	0.2-
670506	808	0.8+	0.6+	761022	381	1.7-	1.0+	801109	688	0.6-	0.7-
670510	808	0.7-	0.9-	761022	381	1.0-	0.8+	801111	688	1.0+	1.4+
670516	808	1.7+	0.1+	801106	688	0.4-	0.2-	801111	688	0.1+	0.6-
670531	808	1.1-	1.2+	801106	688	0.0	0.2-				

(2309)\* 1971 QX1 = 1956 TL = 1974 CU = 1977 SF3

Discovered 1971 Aug. 16 by J. Gibson at the Yale-Columbia Southern Station, El Leoncito, Argentina.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	220.38684		(1950.0)		P		Q
n	0.18877666	Peri.	269.72926	+0.38362441		-0.92055216	
a	3.0095658	Node	157.27277	+0.90481431		+0.35872611	
e	0.0951990	Incl.	10.98123	+0.18477925		+0.15459402	
P	5.22	B(1,0)	12.5				

Residuals in seconds of arc

561009	760	0.1+	0.6-	710824	808	2.2+	0.5-	800417	801	0.3-	0.2+
561009	760	0.7+	0.3+	710826	808	0.5-	2.0-	800510	801	2.0+	0.8+
710816	808	0.1-	0.5+	740214	095	1.7-	2.0-	800606	801	0.0	0.8-
710818	808	3.3-	1.7+	770923	095	1.3+	0.7+				
710818	808	0.4+	2.0-	771008	095	0.8-	0.0				

(2310)\* 1974 SU4 = 1959 CZ = 1971 FS = 1977 JJ

Discovered 1974 Sept. 26 by L. Zhuravleva at the Crimean Astrophysical Observatory. The identification 1974 SU4 = 1971 FS is by T. Urata, who also independently found the identifications 1974 SU4 = 1959 CZ = 1977 JJ (NOC 1147).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	24.64391		(1950.0)		P		Q
n	0.17548534	Peri.	326.75308	-0.01941427		-0.99909133	
a	3.1596731	Node	124.33194	+0.92699557		-0.03220467	
e	0.1411796	Incl.	2.63348	+0.37456948		+0.02791727	
P	5.62	B(1,0)	12.5				

Residuals in seconds of arc

590131	690	0.0	0.9+	741010	808	0.1+	0.3+	741109	808	0.5-	1.5+
590201	690	0.6+	0.7-	741010	808	0.2-	0.1+	770515	095	0.7+	0.1-
590202	690	0.0	0.0	741012	808	0.7-	0.6-	801014	372	2.3-	2.3-
710319	095	1.3-	0.6-	741012	808	0.3+	0.4-	801014	372	0.6-	1.3-
740926	095	0.9+	2.1-	741109	808	0.4-	0.9+	801015	372	3.2+	2.4+

(2311)\* 1974 TA1 = 1944 KD = 1972 KH = 1972 LM = 1976 AE

Discovered 1974 Oct. 10 at the Estacion Astronomica de Altura El Leoncito of the Observatorio Astronomico Felix Aguilar.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	45.62956		(1950.0)		P		Q
n	0.14213857	Peri.	173.60866	+0.87955380		+0.47384275	
a	3.6363143	Node	157.94666	-0.44144346		+0.84648960	
e	0.0369045	Incl.	6.59246	-0.17751840		+0.24275173	
P	6.93	B(1,0)	11.5				

## Residuals in seconds of arc

440518	078	(36.5+ 27.6+)X	741109	808	0.4-	0.5-	800808	688	1.2+	0.4-
720517	095	1.2- 1.0-	741109	808	0.3-	0.2-	800902	688	0.0	0.1-
720606	095	0.8+ 2.4-	741117	808	0.8-	0.3+	800904	688	1.3-	0.9-
741010	808	1.0+ 0.1-	741117	808	0.6-	0.6-	800907	688	0.0	0.3-
741010	808	0.7+ 0.1-	760107	026	1.4-	1.8-	800911	688	0.2+	0.2+
741012	808	0.0 0.8+	760110	026	1.4+	1.9-	801002	688	0.3-	0.1-
741012	808	0.5+ 0.9+	800806	688	1.3+	0.9-	801101	801	1.5-	0.9+

(2312)\* 1976 GU2 = 1976 JN = 1943 DH = 1972 TJ7 = 1973 YE2

Discovered 1976 Apr. 1 by N. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	16.17262		(1950.0)		P		Q
n	0.12401408	Peri.	351.16663		+0.60064605		-0.79549281
a	3.9824962	Node	61.87707		+0.73894202		+0.51409581
e	0.1378216	Incl.	5.21073		+0.30526873		+0.32077513
P	7.95	B(1,0)	11.0				

## Residuals in seconds of arc

430226	062	1.4+ 1.1+	721013	095	1.1+	0.8-	760502	095	0.0	0.0
430301	062	0.7- 0.3+	731220	095	0.8-	1.9-	801031	801	0.3+	2.5+
430311	062	0.2+ 0.3-	760401	095	0.9+	0.4+	801103	801	0.4-	2.0+
721006	095	1.1- 2.0-	760404	095	0.2+	1.3+	801106	801	1.0-	1.4+

(2313)\* 1976 TA = 1949 TE = 1972 RA1

Discovered 1976 Oct. 15 by H. L. Giclas at the Anderson Mesa Station of the Lowell Observatory. The identifications are by E. Bowell (MPC 4829). The 1978 observation was identified at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	106.73920		(1950.0)		P		Q
n	0.25593365	Peri.	108.67365		+0.92588983		+0.37702079
a	2.4568829	Node	229.18472		-0.35751948		+0.85374831
e	0.1911760	Incl.	1.82881		-0.12209769		+0.35912273
P	3.85	B(1,0)	14.2				

## Residuals in seconds of arc

491015	024	0.4+ 1.5+	760929	095	0.3-	1.2+	780305	095	0.5-	1.0-
491022	024	1.6+ 2.3+	761015	688	1.0+	3.0-	801101	801	0.6-	2.4+
491025	024	4.0- 0.7+	761017	688	3.6+	3.1-	801109	688	0.3+	2.1-
720909	095	1.2+ 0.8-	761025	095	0.7+	1.4+	801109	688	0.6+	0.3-
720910	095	0.8+ 2.9-	761026	095	0.7-	0.7-	801113	688	0.7+	0.8-
760924	095	3.8- 2.7+	761027	095	2.1-	1.6+	801113	688	0.8+	1.3-

(2314)\* 1977 VD

Discovered 1977 Nov. 12 at the Harvard College Observatory's Agassiz Station.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	225.53252		(1950.0)		P		Q
n	0.28995210	Peri.	179.31924		-0.83892241		+0.54143133
a	2.2607466	Node	33.65079		-0.49978683		-0.72614740
e	0.0245969	Incl.	5.73044		-0.21545835		-0.42374763
P	3.40	B(1,0)	14.0				

## Residuals in seconds of arc

771112	801	0.6+ 0.4+	780203	801	0.4-	1.2+	800912	801	1.0+	0.5-
771115	801	1.4+ 0.4-	790223	801	0.7+	0.2-	801011	801	1.5-	0.2-
771117	675	0.6+ 1.7-	790228	801	0.2+	0.4+	801013	801	0.1+	0.8+
771119	801	0.8+ 0.6+	790301	801	0.2-	0.2-	801014	801	0.7-	0.2+
771208	801	2.0- 0.8-	790324	801	0.7+	0.3-				
771216	801	1.9- 1.5+	790421	801	0.7-	0.3-				

(2315)\* 1980 DZ = 1946 SE = 1951 RZ1 = 1972 RS3 = 1975 FC = 1975 GG

Discovered 1980 Feb. 19 by Z. Vavrova at the Klet Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	210.86016		(1950.0)		P		Q
n	0.18890949	Peri.	12.83645		+0.73431769		-0.67235964
a	3.0081550	Node	30.07809		+0.60514307		+0.58612419
e	0.1102693	Incl.	10.73203		+0.30753762		+0.45209617
P	5.22	B(1,0)	12.0				

Residuals in seconds of arc

460925	062	1.0-	0.6+	750316	095	2.4-	0.0	800220	046	0.1-	2.0-	
460925	062	0.4-	0.0	750412	330	3.6+	2.3+	800221	046	0.1-	0.1+	
461003	062	0.6-	0.0	750415	805	2.1-	0.2+	800221	046	0.0	0.2-	
461007	062	0.6-	0.5-	750418	805	2.0-	0.5+	800222	046	1.2+	0.1+	
510905	711	4.7+	1.0-	Y	800215	046	0.1+	0.2-	800222	046	0.6+	0.0
720906	095	0.6-	0.6-		800215	046	0.7-	1.2-	800223	046	0.7-	0.0
720909	095	0.5+	1.4-		800219	046	0.7-	2.0-	800223	046	0.9+	0.7-

(2316)\* 1980 RH = 1933 FS = 1971 DE = 1972 LV

Discovered 1980 Sept. 2 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	110.44035		(1950.0)		P		Q
n	0.25656247	Peri.	146.24310		+0.41828089		+0.90816648
a	2.4528668	Node	148.47379		-0.84017606		+0.39377190
e	0.1623397	Incl.	1.81657		-0.34517426		+0.14204698
P	3.84	B(1,0)	13.6				

Residuals in seconds of arc

330322	024	3.9-	2.0-	800808	688	0.3+	0.1+	800907	688	0.0	1.2-
330327	024	1.6+	4.2-	800808	688	0.5-	0.0	800907	688	0.1-	1.3-
710218	095	0.4+	1.3+	800902	688	1.4+	2.0-	800911	688	0.2-	1.0+
720609	095	1.1-	2.8+	800902	688	0.4+	0.2+	800911	688	0.1+	1.2+
720615	095	1.1+	0.4+	800904	688	1.2+	1.0-	801002	688	0.4-	0.7+
800719	688	0.9+	1.0-	800904	688	1.1-	1.4-				

(2317)\* 2524 P-L = 1976 SY7

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	51.75919		(1950.0)		P		Q
n	0.24600124	Peri.	203.01135		+0.86477905		-0.50207054
a	2.5225775	Node	187.14595		+0.47129725		+0.81774695
e	0.1675811	Incl.	4.18386		+0.17330925		+0.28145173
P	4.01	B(1,0)	14.5				

Residuals in seconds of arc

600924	675	0.0	0.7-	601022	675	0.3-	0.8+	761025	095	1.0-	2.0-
600926	675	0.4-	1.1-	601025	675	1.3+	1.0+	800919	801	0.7-	0.6-
600928	675	0.6-	0.3-	601026	675	0.2+	0.7+	800920	801	1.5-	0.2+
600929	675	0.4+	0.0	760925	095	0.5-	1.4+	801013	801	1.0+	1.3+
601017	675	0.2-	0.3-	760928	095	2.6+	0.3-	801103	801	1.2+	0.4-

(2318)\* 6521 P-L = 1970 QB = 1977 TR3

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	30.66228		(1950.0)		P		Q
n	0.29162436	Peri.	240.86928		+0.83039930		-0.55643463
a	2.2520957	Node	152.91015		+0.53050631		+0.77393560
e	0.1321737	Incl.	3.59975		+0.17029403		+0.30233126
P	3.38	B(1,0)	15.0				

## Residuals in seconds of arc

600924	675	0.6+	0.1+	601025	675	0.3+	0.9+	771108	330	0.6+	0.3-
600926	675	0.8+	0.1+	601026	675	1.1+	0.8+	771111	330	0.5+	0.6+
600927	675	0.6+	0.6-	700828	095	0.8-	1.1-	800709	801	0.6-	1.4+
600928	675	1.0+	0.3-	771012	330	4.1+	2.8+	800813	801	0.9-	1.4+
601017	675	0.4-	0.7+	771103	330	0.9-	0.6-	800904	801	2.6+	1.0+
601022	675	0.6+	0.6+	771104	330	0.1-	1.4-				

(2319)\* 7631 P-L = 1975 UC = 1975 VJ9

Discovered 1960 Oct. 17 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels. The double designation 1975 UC = 1975 VJ9 was independently found by O. Kippes.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	58.54730		(1950.0)		P		Q
n	0.19908835	Peri.	265.97359		+0.94758379		-0.31589716
a	2.9047281	Node	112.43613		+0.30983279		+0.87189942
e	0.0932376	Incl.	2.97025		+0.07802947		+0.37416625
P	4.95	B(1,0)	13.2				

## Residuals in seconds of arc

601017	675	0.1+	0.0	751028	026	0.9+	1.7+	751107	095	0.7-	2.0+
601022	675	0.1+	0.1+	751029	026	1.0-	0.3+	780407	095	0.3-	0.6-
601025	675	0.1+	0.4-	751101	095	5.5-	2.4-	790622	801	0.0	0.4-
601026	675	0.3-	0.4-	751102	095	5.7+	2.9+	801106	688	1.1+	2.1-
751027	026	2.3-	0.3-	751105	095	2.0+	0.6+	801106	688	0.1+	2.7-

1928 QB = 1961 VM = 1961 XR = 1971 BM = 1971 FN

The key identification 1928 QB = 1961 VM is by E. Bowell. The double designation 1961 VM = 1961 XR is by O. Kippes (MPC 2324).

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	161.52235		(1950.0)		P		Q
n	0.12434738	Peri.	184.01682		+0.24720328		-0.96610080
a	3.9753845	Node	251.68321		+0.89113394		+0.25683840
e	0.2718677	Incl.	4.49673		+0.38048763		+0.02613981
P	7.93	B(1,0)	11.5				

## Residuals in seconds of arc (or two decimals in units of degrees)

280817	024	(0.07-	0.01+)X	280911	024	(49.2-	36.7-)X	611208	760	1.3+	1.6-
280819	024	0.7+	1.8-	280915	024	0.1+	4.4-	611208	760	0.6+	1.4-
280823	024	5.2+	2.9+	611109	760	1.3-	2.1+	710122	095	1.1+	2.5-
280905	024	1.8-	0.1+	611109	760	1.0-	1.0-	710319	095	3.5-	3.3-
280907	024	(8.5-	27.9+)X	611111	760	2.1+	0.3+				
280908	024	2.1-	3.2-	611111	760	1.4-	1.5+				

1959 RJ = 1959 TC = 1929 SL = 1951 YL1 = 1964 YD = 1976 QT

The double designation 1959 RJ = 1959 TC was published in JC 189/190.

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	36.39850		(1950.0)		P		Q
n	0.23016916	Peri.	194.14616		+0.99341412		+0.11027290
a	2.6369718	Node	159.44555		-0.09460549		+0.94262066
e	0.1654420	Incl.	5.08467		-0.06463884		+0.31512880
P	4.28	B(1,0)	13.0				

## Residuals in seconds of arc

290929	690	(7.4+	15.9-)X	591007	760	2.0-	0.3-	760828	675	0.2+	0.2-	
511227	711	0.7+	0.2-	Y	591007	760	0.0	0.7-	760830	675	0.4+	0.7-
590907	760	0.3+	2.3+		641231	330	0.5-	0.1-	760924	095	1.1-	0.4+
590907	760	0.1-	2.3+		760826	095	1.0-	0.5+	760927	675	0.3+	1.0-
591001	024	0.6+	1.4-		760827	675	1.1+	0.6-	760927	675	1.0+	0.6-

1975 FW = 1950 LU = 1955 HF = 1962 WV = 1965 GB = 1969 AL

The identification 1975 FW = 1955 HF is by E. Bowell. All of the identifications were independently found by T. Urata.

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	311.85298		(1950.0)		P		Q
n	0.18947150	Peri.	243.05112	+0.41833102		+0.89585087	
a	3.0022094	Node	52.48379	-0.75185808		+0.43409263	
e	0.0895344	Incl.	10.88878	-0.50961610		+0.09494629	
P	5.20	B(1,0)	12.5				

Residuals in seconds of arc (or two decimals in units of degrees)

500615	760	3.2+	0.1-	621126	760	1.1-	0.9+	750401	330	0.5+	1.4+
550427	760	1.5-	2.4+	621126	760	0.7-	0.8+	750403	330	3.1-	1.3-
550427	760	0.5+	0.3-	650401	760(0.05-	0.01-)	X	750411	330	1.8+	0.3+
550518	760	0.6-	1.2+	690115	095	0.6+	2.6+				
550518	760	0.0	1.1+	750317	330	0.7+	2.7-				

1980 PN = 1975 SA

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	19.68046		(1950.0)		P		Q
n	0.18934158	Peri.	272.62412	+0.84307047		-0.53754996	
a	3.0035826	Node	119.89338	+0.50065613		+0.77326502	
e	0.1562201	Incl.	1.09045	+0.19640674		+0.33630528	
P	5.21	B(1,0)	12.9				

Residuals in seconds of arc

750928	688	2.2+	0.8+	751011	688	2.3-	0.7-	800808	688	0.2-	1.4-
751004	688	1.6+	1.3+	800717	688	1.3-	1.2+	800907	688	0.2+	0.3+
751010	688	0.5-	1.2-	800719	688	0.3-	0.5-	801008	688	0.5+	1.3+

1980 RY = 1948 WH = 1971 TD3

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	16.46165		(1950.0)		P		Q
n	0.21255358	Peri.	214.93665	+0.60507783		-0.79506622	
a	2.7807245	Node	197.94643	+0.75787958		+0.59128468	
e	0.2186293	Incl.	7.80404	+0.24392491		+0.13510040	
P	4.64	B(1,0)	13.7				

Residuals in seconds of arc

481125	012(10.6+	2.5+)		711011	095	0.4-	2.0-	800917	688	0.4-	0.9+
481127	012	0.8-	1.0-	711021	095	1.6+	2.6+	801002	688	1.3+	0.0
481130	012	0.9+	0.5+	800806	688	0.2+	0.2-				
711010	095	1.4-	0.2-	800907	688	0.9-	0.8-				

\* \* \* \* \*

ORBITAL ELEMENTS BY S. NAKANO, SUMOTO, AND T. URATA, SHIMIZU, JAPAN.

The following orbital elements are from NOC 1148-1153. The identifications are by T. Urata unless otherwise stated.

(2320)\* 1979 QJ = 1950 NF1 = 1951 VG = 1955 ME = 1968 UE3 = 1972 LN  
= 1975 AQ

Discovered 1979 Aug. 29 by P. Wild at Zimmerwald. The 1978 observation was identified at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	127.97623		(1950.0)		P		Q
n	0.17507135	Peri.	249.51533	+0.97245005		-0.15428016	
a	3.1646522	Node	119.00198	+0.20195034		+0.93200125	
e	0.1322268	Incl.	11.52574	-0.11643438		+0.32798063	
P	5.63	B(1,0)	11.9				

## Residuals in seconds of arc

500710	078	0.4-	1.4+	Y	720610	095	0.9-	2.8-	790927	026	1.0+	3.6-
511103	711	(42.0+	26.5-)	Y	750113	095	0.1-	1.7-	791002	026	0.3-	0.7-
550619	760	1.5-	0.9-		750116	095	0.6-	1.6-	791018	026	0.4-	0.3+
550619	760	0.9-	0.2-		780706	095	(0.5-	2.8-)	791019	026	1.1-	0.0
681024	095	3.4+	0.4+		790829	026	2.0+	1.1+	791123	026	1.9-	0.9+
720606	095	2.8+	1.2-		790919	026	2.1+	0.1-	791129	026	2.5-	0.0

(2321)\* 1980 DB1 = 1957 WF1 = 1972 RZ3 = 1973 YT2 = 1975 GN = 1977 QX3  
 = 1977 RG1 = 1977 TN1

Discovered 1980 Feb. 19 by Z. Vavrova at the Klet Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 208.03948		(1950.0)		P		Q
n	0.18934927	Peri.	5.18937	+0.63194039		-0.76889477
a	3.0034954	Node	45.66158	+0.70604788		+0.51942416
e	0.0671075	Incl.	7.81255	+0.31960558		+0.37282618
P	5.21	B(1,0)	12.9			

## Residuals in seconds of arc

571126	760	0.1+	1.8-	770824	095	0.5-	1.0-	800221	046	1.0+	1.3-
571126	760	0.9-	0.5-	770907	095	1.3-	0.7+	800221	046	0.7-	0.5+
720906	095	3.6+	0.3-	771006	095	1.5-	0.4-	800222	046	1.9-	0.4+
721007	095	0.8+	0.2+	800215	046	0.5-	0.7+	800222	046	2.1-	0.1-
731220	095	1.0+	2.7+	800215	046	0.5-	0.6-	800223	046	0.4-	0.2-
750415	805	1.6+	0.3-	800219	046	1.6+	0.2-	800223	046	0.4-	0.0
750418	805	0.1+	0.7-	800220	046	1.1+	0.8-				

1972 TF2 = 1972 TK4 = 1961 TC1 = 1977 RW4 = 1977 TF4

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 240.21308		(1950.0)		P		Q
n	0.18628888	Peri.	180.64795	+0.86101233		-0.50243334
a	3.0363006	Node	209.92960	+0.46730209		+0.84274822
e	0.1071927	Incl.	9.09381	+0.20071501		+0.19322568
P	5.29	B(1,0)	12.3			

## Residuals in seconds of arc

611010	760	0.6-	0.5+	721008	095	2.7-	2.7+	770909	095	0.2-	3.3-
611010	760	0.4-	2.6+	721202	095	1.4+	1.6+	771006	095	0.6+	1.0+
721005	095	0.4+	6.2-	721206	095	1.2+	1.0+				

1980 KJ = 1963 SM = 1974 UN = 1974 VG2 = 1974 XK

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M 327.58779		(1950.0)		P		Q
n	0.27488956	Peri.	165.20365	+0.87744984		-0.47403283
a	2.3425997	Node	223.34008	+0.42849923		+0.84332543
e	0.1185825	Incl.	6.13191	+0.21556943		+0.25317009
P	3.59	B(1,0)	13.9			

## Residuals in seconds of arc (or two decimals in units of degrees)

630919	760	(0.19-	0.04-)	X	800524	809	0.4-	0.0	800603	809	0.6+	0.3-
741023	330	2.1+	0.9+		800525	809	0.9+	0.2-	800603	809	0.8-	0.3-
741115	095	(1.4+	13.4+)		800525	809	1.2+	0.3+	800603	809	0.7-	0.2-
741117	095	3.6+	0.4-		800526	809	1.4+	0.5+	800603	809	0.3-	0.3-
741118	095	3.2-	2.0-		800526	809	0.5-	1.1+	800604	809	0.4+	0.8-
741214	095	2.4-	1.6-		800531	809	0.1-	0.3-	800604	809	0.5+	0.8-
800522	809	0.7-	0.2+		800531	809	0.1-	0.9-	800604	809	1.0+	0.6-
800522	809	0.3-	0.5-		800531	809	0.3-	0.5-	800611	809	0.3+	1.7+
800522	809	0.6-	0.2+		800601	809	1.4-	0.5-	800611	809	0.2+	1.3+
800523	809	0.4-	0.5+		800601	809	0.3-	0.3-	800611	809	0.3+	1.1+
800523	809	0.0	0.2+		800602	809	0.3+	0.3-	800612	809	0.6+	0.9-
800523	809	0.2-	0.4+		800603	809	0.1+	0.2-	800612	809	0.3-	1.3-
800524	809	0.4-	0.6-		800603	809	0.6+	0.3-	800612	809	1.7-	1.1-

1980 OE = 1977 SC3 = 1977 TT4

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)  
 M 113.50413 (1950.0) P Q  
 n 0.30750068 Peri. 19.32000 +0.69307977 +0.72057525  
 a 2.1738998 Node 294.56035 -0.66424653 +0.62745940  
 e 0.1866098 Incl. 1.27836 -0.28003031 +0.29506950  
 P 3.21 B(1,0) 15.0

Residuals in seconds of arc

770922 095	0.5+	0.7+	800717 688	0.0	0.5-	800917 688	0.8-	2.0-
771007 095	0.8-	0.2+	800808 688	0.4-	1.0+			
800717 688	0.7-	0.9+	800907 688	1.9+	0.1+			

1980 OH = 1977 BF = 1978 EZ5

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)  
 M 102.37417 (1950.0) P Q  
 n 0.17424290 Peri. 188.96994 +0.11195345 +0.99265283  
 a 3.1746817 Node 87.46748 -0.90879552 +0.12096036  
 e 0.1477636 Incl. 2.63336 -0.40194168 +0.00299216  
 P 5.66 B(1,0) 12.4

Residuals in seconds of arc

770120 095	0.0	0.5+	800717 688	0.3+	1.2+	800808 688	1.2-	1.0-
780306 095	0.4-	1.1-	800717 688	0.8+	0.9+	800907 688	0.4+	1.7-

\* \* \* \* \*

EPHEMERIDES.

Comet Meier (1980q)

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Elements MPC 5640 ml
1980 10 28		18 19.43	+48 39.9	1.425	1.631	82.8	37.2	9.9
1980 11 07		18 05.48	+41 36.5					
1980 11 17		17 58.63	+36 03.0	1.677	1.553	65.5	35.4	10.0
1980 11 27		17 55.36	+31 44.9					
1980 12 07		17 53.97	+28 26.2	1.895	1.522	53.1	31.1	10.2
1980 12 17		17 53.47	+25 54.8					
1980 12 27		17 53.18	+24 01.4	2.018	1.542	47.9	28.2	10.4
1981 01 06		17 52.61	+22 39.5					
1981 01 16		17 51.23	+21 44.9	2.023	1.609	51.6	28.6	10.6
1981 01 26		17 48.48	+21 14.5					
1981 02 05		17 43.69	+21 06.4	1.916	1.717	63.3	30.9	10.8
1981 02 15		17 35.97	+21 18.5					
1981 02 25		17 24.23	+21 47.6	1.728	1.856	81.3	31.8	10.9
1981 03 07		17 07.10	+22 28.3					
1981 03 17		16 43.15	+23 09.3	1.519	2.017	104.8	28.5	11.0
1981 03 27		16 11.53	+23 31.0					
1981 04 06		15 32.99	+23 07.6	1.393	2.194	132.1	19.8	11.1
1981 04 16		14 50.98	+21 38.1					
1981 04 26		14 10.77	+19 04.6	1.468	2.380	147.7	13.1	11.6
1981 05 06		13 36.66	+15 52.6					
1981 05 16		13 10.37	+12 31.5	1.768	2.571	133.6	16.6	12.3
1981 05 26		12 51.49	+09 20.6					
1981 06 05		12 38.73	+06 27.2	2.219	2.767	112.2	19.9	13.2
1981 06 15		12 30.71	+03 51.6					
1981 06 25		12 26.28	+01 31.3	2.739	2.963	92.5	20.0	13.9
1981 07 05		12 24.56	-00 36.7					
1981 07 15		12 24.89	-02 35.2	3.272	3.160	74.7	18.1	14.6
1981 07 25		12 26.76	-04 26.3					
1981 08 04		12 29.80	-06 11.8	3.779	3.357	58.2	14.9	15.1

1981 08 14	12 33.74	-07 53.2						
1981 08 24	12 38.34	-09 31.3	4.232	3.553	42.5	11.1	15.6	

## Periodic Comet Russell 2 (1980o)

Elements MPC 5639

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	ml
1980 11 17		22 14.29	-23 02.0	2.285	2.532	92.8	22.9	17.8
1980 11 27		22 25.08	-21 01.0					
1980 12 07		22 36.78	-18 58.7	2.603	2.605	79.2	21.8	18.2
1980 12 17		22 49.17	-16 55.6					
1980 12 27		23 02.07	-14 52.3	2.922	2.681	66.2	19.6	18.6
1981 01 06		23 15.36	-12 49.0					
1981 01 16		23 28.92	-10 46.3	3.227	2.759	53.6	16.7	19.0
1981 01 26		23 42.66	-08 44.6					
1981 02 05		23 56.51	-06 44.4	3.506	2.839	41.2	13.2	19.3

## Comet Russell (19801)

Elements MPC 5640

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	ml
1980 11 17		22 55.03	-63 07.0	2.394	2.468	82.5	23.4	16.3
1980 11 27		22 22.26	-61 33.8					
1980 12 07		22 00.04	-59 40.6	2.618	2.358	64.0	22.1	16.3
1980 12 17		21 45.77	-57 46.6					
1980 12 27		21 37.04	-56 01.5	2.798	2.265	48.2	18.9	16.3
1981 01 06		21 32.11	-54 29.4					
1981 01 16		21 29.69	-53 12.5	2.890	2.192	37.4	15.8	16.2
1981 01 26		21 28.83	-52 11.6					
1981 02 05		21 28.84	-51 27.6	2.867	2.142	35.5	15.5	16.1
1981 02 15		21 29.09	-51 01.6					
1981 02 25		21 28.98	-50 55.3	2.723	2.117	43.5	18.8	15.9
1981 03 07		21 27.88	-51 11.2					
1981 03 17		21 24.94	-51 52.6	2.467	2.118	58.1	23.5	15.7
1981 03 27		21 18.93	-53 03.5					
1981 04 06		21 07.95	-54 48.3	2.131	2.145	77.3	27.1	15.5
1981 04 16		20 48.70	-57 08.0					
1981 04 26		20 15.70	-59 52.1	1.771	2.197	101.0	26.7	15.2
1981 05 06		19 20.96	-62 18.4					
1981 05 16		18 01.11	-62 44.7	1.495	2.272	129.0	20.2	14.9
1981 05 26		16 34.41	-59 15.7					
1981 06 05		15 27.81	-52 06.8	1.453	2.366	146.4	13.7	15.1
1981 06 15		14 46.33	-43 35.3					
1981 06 25		14 22.38	-35 39.0	1.707	2.477	129.1	18.6	15.6
1981 07 05		14 09.17	-29 06.7					
1981 07 15		14 02.59	-24 02.0	2.153	2.602	104.6	22.2	16.3
1981 07 25		14 00.22	-20 10.5					
1981 08 04		14 00.68	-17 15.7	2.670	2.738	83.0	21.6	17.0
1981 08 14		14 03.09	-15 03.2					
1981 08 24		14 06.90	-13 21.9	3.181	2.882	63.8	18.4	17.6
1981 09 03		14 11.71	-12 03.4					
1981 09 13		14 17.27	-11 01.4	3.642	3.033	46.1	13.8	18.1

## Periodic Comet Longmore (1974 XIV)

Elements NK 338

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		m2
1980 12 27		11 04.32	+35 32.0	2.411	3.007	-0.93	+10.3	19.2
1981 01 06		11 05.60	+36 16.5					
1981 01 16		11 03.92	+37 07.8	2.164	2.944	-1.08	+11.3	18.9
1981 01 26		10 59.14	+37 59.7					
1981 02 05		10 51.38	+38 44.1	1.993	2.881	-1.24	+11.6	18.6
1981 02 15		10 41.19	+39 11.7					
1981 02 25		10 29.63	+39 14.2	1.919	2.820	-1.32	+10.8	18.4
1981 03 07		10 17.99	+38 46.8					



1981 03 17	10 07.67	+37 48.9	1.945	2.762	-1.26	+9.7	18.4
1981 03 27	09 59.71	+36 24.1					
1981 04 06	09 54.68	+34 38.3	2.055	2.706	-1.10	+9.0	18.4
1981 04 16	09 52.74	+32 37.2					
1981 04 26	09 53.72	+30 26.0	2.221	2.653	-0.95	+8.9	18.5
1981 05 06	09 57.29	+28 08.2					
1981 05 16	10 03.10	+25 45.9	2.414	2.604	-0.81	+9.0	18.6
1981 05 26	10 10.75	+23 20.7					
1981 06 05	10 19.94	+20 53.1	2.614	2.558	-0.72	+9.2	18.7
1981 06 15	10 30.38	+18 23.5					
1981 06 25	10 41.84	+15 52.0	2.805	2.518	-0.65	+9.4	18.8
1981 07 05	10 54.14	+13 18.7					
1981 07 15	11 07.16	+10 43.6	2.978	2.483	-0.61	+9.6	18.8
1981 07 25	11 20.78	+08 06.9					
1981 08 04	11 34.93	+05 28.8	3.126	2.453	-0.58	+9.7	18.9
1981 08 14	11 49.55	+02 49.3					
1981 08 24	12 04.60	+00 09.0	3.244	2.430	-0.57	+9.7	18.9

## Periodic Comet Finlay

## Elements MPC 5639

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		m2
1981 02 05		19 01.00	-24 38.2	2.763	1.995	-1.21	-1.2	21.2
1981 02 15		19 27.59	-23 59.4					
1981 02 25		19 55.46	-23 01.1	2.471	1.820	-1.47	-3.5	20.9
1981 03 07		20 24.65	-21 40.8					
1981 03 17		20 55.19	-19 55.9	2.185	1.645	-1.76	-6.7	20.5
1981 03 27		21 27.12	-17 44.0					
1981 04 06		22 00.47	-15 03.3	1.930	1.477	-2.04	-10.9	20.2
1981 04 16		22 35.22	-11 53.1					
1981 04 26		23 11.35	-08 14.8	1.730	1.324	-2.27	-15.3	19.9
1981 05 06		23 48.79	-04 12.5					
1981 05 16		00 27.39	+00 06.0	1.603	1.199	-2.41	-18.0	19.6
1981 05 26		01 06.97	+04 30.2					
1981 06 05		01 47.25	+08 47.4	1.559	1.120	-2.43	-17.4	19.4
1981 06 15		02 27.85	+12 45.0					
1981 06 25		03 08.34	+16 12.5	1.584	1.103	-2.31	-13.5	19.4
1981 07 05		03 48.20	+19 03.1					
1981 07 15		04 26.85	+21 13.8	1.650	1.152	-2.06	-8.2	19.5
1981 07 25		05 03.80	+22 45.8					
1981 08 04		05 38.58	+23 42.8	1.728	1.257	-1.74	-3.7	19.7
1981 08 14		06 10.87	+24 10.3					
1981 08 24		06 40.50	+24 14.5	1.790	1.398	-1.41	-0.7	20.0
1981 09 03		07 07.36	+24 01.5					
1981 09 13		07 31.43	+23 37.2	1.821	1.560	-1.14	+1.0	20.3
1981 09 23		07 52.72	+23 06.6					
1981 10 03		08 11.23	+22 34.4	1.812	1.732	-0.95	+2.0	20.5
1981 10 13		08 26.89	+22 04.7					
1981 10 23		08 39.65	+21 41.1	1.764	1.907	-0.86	+2.8	20.6
1981 11 02		08 49.33	+21 27.0					
1981 11 12		08 55.73	+21 25.0	1.688	2.082	-0.87	+3.5	20.6
1981 11 22		08 58.63	+21 37.1					
1981 12 02		08 57.82	+22 04.0	1.610	2.254	-0.99	+4.4	20.5
1981 12 12		08 53.24	+22 44.3					
1981 12 22		08 45.13	+23 34.1	1.571	2.423	-1.19	+5.0	20.3
1982 01 01		08 34.13	+24 27.4					
1982 01 11		08 21.38	+25 16.8	1.619	2.586	-1.36	+4.6	20.3
1982 01 21		08 08.31	+25 56.4					
1982 01 31		07 56.34	+26 22.8	1.783	2.745	-1.36	+3.5	20.6
1982 02 10		07 46.61	+26 36.0					
1982 02 20		07 39.71	+26 37.8	2.060	2.899	-1.21	+2.5	21.2

## Periodic Comet Gehrels 3 (1977 VII)

						Elements IAUC		3097
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1981 02 25		19 47.93	-20 26.9	5.344	4.639	40.7	8.0	21.3
1981 03 07		19 56.87	-20 01.4					
1981 03 17		20 05.12	-19 35.8	5.114	4.642	56.6	10.3	21.2
1981 03 27		20 12.58	-19 11.1					
1981 04 06		20 19.12	-18 47.8	4.837	4.644	73.0	11.9	21.1
1981 04 16		20 24.64	-18 26.9					
1981 04 26		20 29.03	-18 09.2	4.532	4.645	90.1	12.5	21.0
1981 05 06		20 32.17	-17 55.4					
1981 05 16		20 33.97	-17 46.1	4.228	4.645	108.3	11.9	20.8
1981 05 26		20 34.34	-17 41.9					
1981 06 05		20 33.27	-17 43.1	3.955	4.645	127.6	10.0	20.7
1981 06 15		20 30.75	-17 49.5					
1981 06 25		20 26.92	-18 00.6	3.748	4.643	148.2	6.6	20.5
1981 07 05		20 21.97	-18 15.6					
1981 07 15		20 16.20	-18 33.2	3.637	4.641	169.9	2.2	20.5
1981 07 25		20 10.01	-18 51.9					
1981 08 04		20 03.84	-19 10.3	3.641	4.638	167.9	2.6	20.5
1981 08 14		19 58.15	-19 27.0					
1981 08 24		19 53.34	-19 41.2	3.760	4.635	146.2	7.0	20.5
1981 09 03		19 49.71	-19 52.1					
1981 09 13		19 47.49	-19 59.4	3.973	4.630	125.5	10.2	20.7
1981 09 23		19 46.77	-20 03.0					
1981 10 03		19 47.59	-20 02.7	4.249	4.625	105.9	12.0	20.8
1981 10 13		19 49.88	-19 58.5					
1981 10 23		19 53.55	-19 50.5	4.553	4.618	87.5	12.4	20.9
1981 11 02		19 58.47	-19 38.4					
1981 11 12		20 04.51	-19 22.4	4.853	4.611	70.1	11.6	21.1
1981 11 22		20 11.50	-19 02.4					
1981 12 02		20 19.32	-18 38.3	5.121	4.603	53.5	9.9	21.2
1981 12 12		20 27.82	-18 10.3					
1981 12 22		20 36.86	-17 38.5	5.337	4.595	37.5	7.5	21.3

## Periodic Comet Wild 3 (1980d)

						Elements MPC		5413
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1981 02 25		20 45.30	-26 25.1	3.289	2.484	30.2	11.6	17.0
1981 03 07		21 05.59	-25 42.7					
1981 03 17		21 25.05	-24 57.4	3.202	2.537	41.0	14.9	17.1
1981 03 27		21 43.61	-24 11.3					
1981 04 06		22 01.23	-23 26.2	3.083	2.594	52.3	17.8	17.1
1981 04 16		22 17.85	-22 44.0					
1981 04 26		22 33.39	-22 06.7	2.934	2.655	64.2	19.9	17.1
1981 05 06		22 47.80	-21 36.1					
1981 05 16		23 00.95	-21 14.2	2.764	2.719	76.9	21.2	17.1
1981 05 26		23 12.73	-21 02.5					
1981 06 05		23 23.00	-21 02.7	2.581	2.785	90.7	21.4	17.0
1981 06 15		23 31.56	-21 16.2					
1981 06 25		23 38.24	-21 43.7	2.402	2.853	106.0	20.0	17.0
1981 07 05		23 42.82	-22 25.3					
1981 07 15		23 45.11	-23 20.0	2.246	2.923	122.7	17.0	16.9
1981 07 25		23 44.99	-24 25.2					
1981 08 04		23 42.41	-25 36.6	2.143	2.994	140.2	12.5	16.9
1981 08 14		23 37.58	-26 48.3					
1981 08 24		23 30.89	-27 53.2	2.120	3.065	154.8	8.1	17.0
1981 09 03		23 23.00	-28 44.5					
1981 09 13		23 14.75	-29 16.8	2.197	3.137	154.7	7.9	17.2
1981 09 23		23 07.03	-29 27.5					
1981 10 03		23 00.57	-29 16.4	2.375	3.208	140.2	11.5	17.4

1981 10 13	22 55.92	-28 45.6							
1981 10 23	22 53.34	-27 58.4	2.637	3.279	122.4	14.8	17.8		
1981 11 02	22 52.87	-26 58.0							
1981 11 12	22 54.43	-25 47.6	2.955	3.350	105.0	16.6	18.1		
1981 11 22	22 57.79	-24 29.8							
1981 12 02	23 02.74	-23 06.6	3.301	3.420	88.5	16.7	18.4		
1981 12 12	23 09.03	-21 39.5							
1981 12 22	23 16.43	-20 09.7	3.649	3.489	72.9	15.6	18.7		
1982 01 01	23 24.75	-18 38.2							
1982 01 11	23 33.81	-17 05.7	3.978	3.557	58.1	13.6	19.0		
1982 01 21	23 43.44	-15 33.1							
1982 01 31	23 53.54	-14 00.7	4.269	3.624	43.9	10.9	19.2		
1982 02 10	00 03.98	-12 29.3							
1982 02 20	00 14.67	-10 59.4	4.509	3.690	30.4	7.8	19.4		

## Periodic Comet Slaughter-Burnham

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation	Elements NK 379	m2
1981 04 06		22 53.89	-08 53.7	3.822	3.048	-0.60	-5.2	19.8
1981 04 16		23 07.96	-07 13.4					
1981 04 26		23 21.80	-05 32.0	3.580	2.973	-0.65	-5.8	19.5
1981 05 06		23 35.37	-03 50.1					
1981 05 16		23 48.60	-02 08.3	3.307	2.903	-0.71	-6.5	19.2
1981 05 26		00 01.44	-00 27.3					
1981 06 05		00 13.79	+01 12.3	3.015	2.836	-0.79	-7.3	18.9
1981 06 15		00 25.55	+02 49.7					
1981 06 25		00 36.60	+04 24.3	2.713	2.775	-0.90	-8.1	18.6
1981 07 05		00 46.77	+05 55.2					
1981 07 15		00 55.86	+07 21.7	2.414	2.719	-1.03	-9.0	18.3
1981 07 25		01 03.66	+08 42.8					
1981 08 04		01 09.91	+09 57.7	2.131	2.671	-1.20	-10.1	17.9
1981 08 14		01 14.33	+11 05.0					
1981 08 24		01 16.68	+12 03.6	1.883	2.629	-1.39	-11.5	17.6
1981 09 03		01 16.76	+12 52.0					
1981 09 13		01 14.55	+13 28.6	1.693	2.595	-1.58	-12.9	17.3
1981 09 23		01 10.25	+13 52.7					
1981 10 03		01 04.36	+14 04.0	1.584	2.569	-1.69	-14.1	17.1
1981 10 13		00 57.70	+14 04.3					
1981 10 23		00 51.24	+13 57.0	1.576	2.553	-1.66	-14.5	17.1
1981 11 02		00 45.95	+13 46.9					
1981 11 12		00 42.61	+13 39.1	1.669	2.545	-1.52	-13.8	17.2
1981 11 22		00 41.67	+13 37.9					
1981 12 02		00 43.30	+13 46.3	1.842	2.546	-1.35	-12.3	17.4
1981 12 12		00 47.47	+14 05.9					
1981 12 22		00 53.95	+14 36.7	2.071	2.557	-1.20	-10.7	17.7
1982 01 01		01 02.50	+15 17.9					
1982 01 11		01 12.87	+16 08.3	2.332	2.576	-1.10	-9.2	17.9
1982 01 21		01 24.77	+17 06.1					
1982 01 31		01 38.01	+18 09.6	2.605	2.605	-1.02	-7.8	18.2
1982 02 10		01 52.38	+19 17.0					
1982 02 20		02 07.71	+20 26.4	2.877	2.641	-0.96	-6.5	18.5
1982 03 02		02 23.88	+21 36.4					
1982 03 12		02 40.75	+22 45.2	3.138	2.685	-0.92	-5.3	18.8
1982 03 22		02 58.21	+23 51.4					
1982 04 01		03 16.18	+24 53.9	3.378	2.736	-0.89	-4.1	19.0
1982 04 11		03 34.55	+25 51.6					
1982 04 21		03 53.24	+26 43.3	3.591	2.793	-0.86	-3.0	19.2
1982 05 01		04 12.15	+27 28.6					
1982 05 11		04 31.19	+28 06.8	3.770	2.856	-0.82	-2.0	19.4

## Periodic Comet Gehrels 2 (1973 IX)

Date	ET	R. A. (1950)	Decl.	Delta	r	Elements MPC		5640
						Variation		m2
1981 04 06		22 58.50	-01 40.1	3.640	2.827	-0.69	-3.4	20.3
1981 04 16		23 13.90	-00 04.8					
1981 04 26		23 29.21	+01 31.7	3.425	2.759	-0.75	-3.7	20.1
1981 05 06		23 44.39	+03 08.4					
1981 05 16		23 59.41	+04 44.6	3.179	2.694	-0.83	-4.0	19.8
1981 05 26		00 14.22	+06 19.1					
1981 06 05		00 28.77	+07 51.0	2.911	2.633	-0.92	-4.3	19.5
1981 06 15		00 42.98	+09 19.1					
1981 06 25		00 56.74	+10 42.4	2.630	2.576	-1.05	-4.5	19.2
1981 07 05		01 09.94	+11 59.7					
1981 07 15		01 22.39	+13 09.6	2.346	2.525	-1.20	-4.7	18.9
1981 07 25		01 33.90	+14 10.7					
1981 08 04		01 44.23	+15 01.7	2.069	2.479	-1.39	-5.0	18.5
1981 08 14		01 53.08	+15 40.7					
1981 08 24		02 00.15	+16 06.3	1.813	2.441	-1.63	-5.5	18.2
1981 09 03		02 05.10	+16 16.6					
1981 09 13		02 07.68	+16 09.9	1.596	2.409	-1.88	-6.3	17.8
1981 09 23		02 07.78	+15 45.4					
1981 10 03		02 05.48	+15 03.0	1.441	2.385	-2.10	-7.4	17.6
1981 10 13		02 01.22	+14 05.2					
1981 10 23		01 55.78	+12 56.7	1.375	2.369	-2.18	-8.2	17.4
1981 11 02		01 50.16	+11 44.8					
1981 11 12		01 45.45	+10 37.8	1.411	2.362	-2.07	-7.9	17.5
1981 11 22		01 42.50	+09 43.1					
1981 12 02		01 41.87	+09 05.5	1.540	2.364	-1.84	-6.9	17.7
1981 12 12		01 43.81	+08 47.1					
1981 12 22		01 48.27	+08 47.5	1.740	2.374	-1.60	-5.7	18.0
1982 01 01		01 55.08	+09 04.7					
1982 01 11		02 03.98	+09 36.1	1.983	2.392	-1.41	-4.7	18.3
1982 01 21		02 14.68	+10 18.5					
1982 01 31		02 26.94	+11 08.9	2.249	2.419	-1.26	-3.7	18.6
1982 02 10		02 40.52	+12 04.7					
1982 02 20		02 55.20	+13 03.1	2.521	2.453	-1.14	-2.9	18.9
1982 03 02		03 10.83	+14 01.9					
1982 03 12		03 27.23	+14 59.3	2.789	2.494	-1.05	-2.1	19.2
1982 03 22		03 44.28	+15 53.3					
1982 04 01		04 01.86	+16 42.7	3.042	2.541	-0.98	-1.4	19.5
1982 04 11		04 19.85	+17 26.2					
1982 04 21		04 38.14	+18 02.8	3.274	2.594	-0.91	-0.7	19.7
1982 05 01		04 56.64	+18 31.7					
1982 05 11		05 15.25	+18 52.5	3.477	2.653	-0.85	+0.0	19.9

## Periodic Comet Swift-Gehrels

Date	ET	R. A. (1950)	Decl.	Delta	r	Elements MPC		5638
						Variation		m2
1981 06 05		22 13.16	-12 43.9	1.930	2.377	-1.39	-11.0	20.2
1981 06 15		22 22.65	-11 20.6					
1981 06 25		22 30.85	-09 55.7	1.563	2.220	-1.77	-14.6	19.4
1981 07 05		22 37.45	-08 29.5					
1981 07 15		22 42.10	-07 02.0	1.236	2.064	-2.31	-19.4	18.6
1981 07 25		22 44.41	-05 33.0					
1981 08 04		22 43.97	-04 02.4	0.965	1.912	-2.99	-25.7	17.7
1981 08 14		22 40.54	-02 30.2					
1981 08 24		22 34.19	-00 56.5	0.765	1.766	-3.67	-33.2	16.9
1981 09 03		22 25.53	+00 37.7					
1981 09 13		22 16.00	+02 11.5	0.644	1.632	-3.95	-40.3	16.2
1981 09 23		22 07.53	+03 44.1					

1981 10 03	22 02.20	+05 16.0	0.596	1.516	-3.70	-45.1	15.7
1981 10 13	22 01.72	+06 50.0					
1981 10 23	22 06.94	+08 29.5	0.597	1.427	-3.32	-47.0	15.4
1981 11 02	22 18.14	+10 17.4					
1981 11 12	22 35.14	+12 15.5	0.627	1.374	-3.18	-46.5	15.4
1981 11 22	22 57.36	+14 22.6					
1981 12 02	23 24.14	+16 34.9	0.681	1.362	-3.34	-43.3	15.5
1981 12 12	23 54.65	+18 47.0					
1981 12 22	00 27.83	+20 51.8	0.771	1.394	-3.60	-36.6	15.9
1982 01 01	01 02.68	+22 43.0					
1982 01 11	01 38.16	+24 16.3	0.910	1.466	-3.69	-26.7	16.5
1982 01 21	02 13.37	+25 29.5					
1982 01 31	02 47.68	+26 22.6	1.106	1.568	-3.48	-16.3	17.2
1982 02 10	03 20.67	+26 57.4					
1982 02 20	03 52.11	+27 15.5	1.356	1.693	-3.02	-7.7	17.9
1982 03 02	04 21.98	+27 19.4					
1982 03 12	04 50.29	+27 10.9	1.651	1.834	-2.49	-2.0	18.7
1982 03 22	05 17.11	+26 51.5					
1982 04 01	05 42.57	+26 22.6	1.979	1.983	-1.99	+1.5	19.5
1982 04 11	06 06.76	+25 45.3					
1982 04 21	06 29.77	+25 00.5	2.327	2.137	-1.57	+3.3	20.1
1982 05 01	06 51.71	+24 09.0					
1982 05 11	07 12.64	+23 11.5	2.680	2.294	-1.24	+4.2	20.7

1940 GN		Elements MPC 5644							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1980 10 28		05 36.57	+21 08.2	2.168	2.905	129.7	15.2	18.3	
1980 11 07		05 32.18	+21 24.2						
1980 11 17		05 25.10	+21 40.6	1.988	2.901	152.4	9.1	18.0	
1980 11 27		05 15.81	+21 56.3						
1980 12 07		05 05.10	+22 10.3	1.910	2.894	177.2	0.9	17.5	
1980 12 17		04 54.06	+22 22.1						
1980 12 27		04 43.89	+22 32.2	1.952	2.885	157.5	7.5	17.9	
1981 01 06		04 35.55	+22 42.2						
1981 01 16		04 29.75	+22 53.8	2.102	2.873	133.9	14.3	18.2	
1981 01 26		04 26.80	+23 08.3						
1981 02 05		04 26.71	+23 26.5	2.325	2.858	113.0	18.5	18.5	
1981 02 15		04 29.35	+23 48.2						
1981 02 25		04 34.44	+24 12.8	2.584	2.841	94.7	20.3	18.8	

(2320) 1979 QJ		Elements MPC 5649							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1980 10 28		08 25.53	+16 29.5	3.012	3.165	89.6	18.3	17.2	
1980 11 07		08 31.34	+16 23.7						
1980 11 17		08 35.25	+16 25.9	2.752	3.190	107.4	17.2	17.0	
1980 11 27		08 37.09	+16 37.6						
1980 12 07		08 36.71	+17 00.0	2.520	3.215	127.4	14.1	16.8	
1980 12 17		08 34.04	+17 33.2						
1980 12 27		08 29.24	+18 16.3	2.352	3.240	149.8	8.8	16.5	
1981 01 06		08 22.61	+19 06.8						
1981 01 16		08 14.75	+20 01.1	2.285	3.265	173.9	1.8	16.1	
1981 01 26		08 06.45	+20 55.2						
1981 02 05		07 58.56	+21 45.2	2.338	3.288	161.6	5.4	16.4	
1981 02 15		07 51.89	+22 28.3						
1981 02 25		07 47.03	+23 03.1	2.504	3.312	138.6	11.4	16.8	
1981 03 07		07 44.33	+23 29.4						
1981 03 17		07 43.92	+23 47.2	2.753	3.334	117.7	15.3	17.1	
1981 03 27		07 45.72	+23 57.4						
1981 04 06		07 49.56	+24 00.4	3.047	3.356	99.2	17.1	17.3	

1974 FG		Elements MPC 5601							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1980 12 27		11 57.28	-05 23.4	1.941	2.228	93.4	26.1	18.3	
1981 01 06		12 07.35	-06 35.7						
1981 01 16		12 15.67	-07 35.7	1.665	2.188	108.6	25.2	17.9	
1981 01 26		12 21.89	-08 20.4						
1981 02 05		12 25.63	-08 46.4	1.415	2.149	126.1	21.8	17.4	
1981 02 15		12 26.52	-08 49.9						
1981 02 25		12 24.42	-08 28.1	1.214	2.111	146.5	15.0	16.9	
1981 03 07		12 19.43	-07 39.3						
1981 03 17		12 12.17	-06 25.7	1.089	2.075	169.4	5.0	16.3	
1981 03 27		12 03.74	-04 54.4						
1981 04 06		11 55.53	-03 16.3	1.060	2.041	164.2	7.7	16.3	
1981 04 16		11 48.97	-01 44.0						
1981 04 26		11 45.09	-00 28.2	1.122	2.010	141.5	18.2	16.7	
1981 05 06		11 44.40	+00 24.7						
1981 05 16		11 47.01	+00 52.3	1.250	1.982	122.1	25.6	17.1	
1981 05 26		11 52.69	+00 55.3						
1981 06 05		12 01.08	+00 35.9	1.415	1.958	106.2	29.8	17.4	

## (2218) 1975 AK

(2218) 1975 AK		Elements MPC 5221							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 01 16		13 04.44	+11 08.3	2.769	3.160	104.3	17.6	18.0	
1981 01 26		13 08.14	+11 47.0						
1981 02 05		13 09.79	+12 38.9	2.547	3.189	122.6	15.1	17.8	
1981 02 15		13 09.23	+13 41.7						
1981 02 25		13 06.48	+14 51.6	2.382	3.217	141.6	11.0	17.6	
1981 03 07		13 01.69	+16 03.3						
1981 03 17		12 55.25	+17 10.4	2.306	3.245	156.8	7.0	17.4	
1981 03 27		12 47.76	+18 06.2						
1981 04 06		12 39.96	+18 45.5	2.338	3.271	154.7	7.5	17.5	
1981 04 16		12 32.62	+19 05.0						
1981 04 26		12 26.41	+19 03.8	2.474	3.297	138.5	11.7	17.7	
1981 05 06		12 21.79	+18 43.2						
1981 05 16		12 19.04	+18 05.5	2.692	3.321	120.5	15.2	18.0	
1981 05 26		12 18.20	+17 13.7						
1981 06 05		12 19.23	+16 10.7	2.961	3.344	103.4	17.2	18.3	
1981 06 15		12 21.97	+14 59.0						
1981 06 25		12 26.25	+13 40.8	3.251	3.366	87.6	17.6	18.5	

## (2234) Schmadel

(2234) Schmadel		Elements MPC 5280							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 01 16		13 19.73	-04 16.2	2.407	2.684	95.3	21.4	17.9	
1981 01 26		13 24.47	-05 41.4						
1981 02 05		13 27.05	-07 02.7	2.096	2.641	112.9	20.1	17.6	
1981 02 15		13 27.10	-08 19.6						
1981 02 25		13 24.31	-09 31.6	1.822	2.599	132.8	16.2	17.2	
1981 03 07		13 18.45	-10 37.6						
1981 03 17		13 09.62	-11 36.2	1.619	2.556	155.1	9.4	16.7	
1981 03 27		12 58.33	-12 25.9						
1981 04 06		12 45.51	-13 06.0	1.519	2.514	172.4	3.0	16.3	
1981 04 16		12 32.50	-13 37.1						
1981 04 26		12 20.68	-14 02.2	1.533	2.473	153.0	10.6	16.5	
1981 05 06		12 11.15	-14 25.2						
1981 05 16		12 04.64	-14 50.6	1.645	2.432	131.1	18.3	16.8	
1981 05 26		12 01.37	-15 22.2						
1981 06 05		12 01.26	-16 02.1	1.817	2.393	112.2	23.1	17.1	
1981 06 15		12 04.09	-16 51.8						
1981 06 25		12 09.52	-17 51.5	2.016	2.355	96.3	25.4	17.4	