

# Catalogue GOCKU96 of positions and orbital elements of geosynchronous space objects observed in 1996

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**Abstract.** Catalogue GOCKU96 (Geosynchronous Objects Catalogue: Kiev—Uzhgorod 1996) containing the topocentric equatorial coordinates and orbital elements of geosynchronous objects obtained by photographic observations at the Main Astronomical Observatory of the National Academy of Sciences of Ukraine in Kiev and at the Space Research Laboratory of Uzhgorod State University in 1996 is presented. The accuracy of positions is about 0.6 arcsec of the Kiev observations and 1.5 arcsec of the Uzhgorod data. Using different catalogues of orbits, we have identified 1630 observations of 109 objects among the total 1962 observations of 183 objects. A few objects not present in the NASA Two-Line Elements Catalogues have been detected.

## INTRODUCTION

Recently, the problem of collisions of active satellites with pieces of space debris has become important due to rapid increase of the number of objects in the geostationary ring. Therefore, monitoring of the geostationary ring is performed by photographic technique in order to detect objects in this ring, determine their orbits, identify the objects observed and maintain the catalogues of these objects. Observations of uncontrolled geosynchronous satellites could be also used for studying the long-term evolution of their orbits and improving the theory of motion.

## OBSERVATIONS

Photographic survey of the geostationary region was performed at the Main Astronomical Observatory of the National Academy of Sciences of Ukraine (MAO NASU) in Kiev and Space Research Laboratory of Uzhgorod State University (SRL USU) in Uzhgorod in 1996 following the method of the previous surveys

(Kizyun & Safronov 1995; Demchyk et al. 1996). Total number of observations and objects, those identified and unidentified, for each of two stations is summarized in Table 1. Hereinafter we use designation of the type of the object motion according to Sochilina et al. 1996: letter (c) denotes controlled satellites, (d) is used for drifting objects and (l) stands for librating ones.

The survey at MAO NASU was carried out in three longitude windows ( $14^{\circ}$  W —  $0^{\circ}$  W,  $16^{\circ}$  E —  $31^{\circ}$  E,  $55^{\circ}$  E —  $65^{\circ}$  E) on January 18, February 10—25, March 16—18, May 13—15, June 23—24, July 14—15 and October 5—11, 1996 using the double wide-angle astrograph ( $D = 0.4$  m,  $F = 2$  m). The satellite positions (right ascension RA and declination D) reduced using the PPM Star Catalogue in J2000.0 reference frame are given in Table 2. Time instants are given in the UTC scale.

The survey carried out at SRL USU on January 15—16, March 18—19, May 19, September 8, October 4—7, 1996 using the SBG camera ( $D = 0.43$  m,  $F = 0.76$  m) covers the longitudes from  $34^{\circ}$  W to  $29^{\circ}$  E. Table 3 presents the satellite positions reduced

using the SAO Star Catalogue in B1950.0 reference frame. Time instants are given in the UTC(SU) scale.

The object name, its COSPAR designation, the object motion type and objects Greenwich longitude L (degree) are provided for the identified objects. For the unidentified objects the word XXXXX is used instead of the object name, and Greenwich longitude L (degree), longitude drift Lt (degree/day) and orbital inclination i (degree) towards the Earth's equator are given.

The limiting magnitude of the objects detected is 15<sup>m</sup> for the Kiev observations and 14–14.5<sup>m</sup> for the Uzhgorod data under the best weather conditions.

Orbit determination. Orbits of the objects shown in Tables 2 and 3 have been computed independently by two different software packages. The first one (Kirichenko & Klimik 1994) allows to derive orbital elements referred both to equatorial and Laplace planes. The second one called "Kiev—Geodynamics—G" (Rudenko 1995; Rudenko 1997) is based on the numerical integration of the differential equations of satellite motion. The Earth's gravity field (JGM-3 model) up to  $n = m = 6$  and third-body gravitational attraction by the Moon and Sun are included into the force model. The state-vectors at the orbital arcs having at least four observations were estimated from the least-square adjustment by 2–5 iterations. The mean value of the root-mean-square (rms) values of the post-fit (O—C) residuals in R.A. and Decl. is about 0.6 arcsec for Kiev observations and 1.5 arcsec for Uzhgorod data at 1 to 6-day orbital arcs without orbital manoeuvres.

We have also detected numerous orbital manoeuvres of the controlled satellites. The rms residuals exceed 30 arcsec at an arc containing a manoeuvre while at two subarcs separated by the manoeuvre they have their usual 0.5–1.5 arcsec values. Note that it is the case for the observations of a satellite having no companions located closer than 0.1–0.3°. On the contrary, for the collocated satellites, i.e. separated by less than 0.1–0.3°, the erroneous combination of observations of these satellites can lead to large rms residuals while there is no orbital manoeuvre of any of them. Such situation can take place for observations of six Astra-1 objects. An observation by which an orbital manoeuvre of the satellite is followed is marked by asterisk in the last column of Tables 2 and 3.

Tables 4 and 5 contain the osculating Keplerian orbital elements and some additional data for the objects when more than three observations are available. The columns contain the orbital arc number, time in MJD (TAI) scale, Incl. — orbital inclination,  $\omega$  — argument of perigee (degree), Node — longitude

of the ascending node (degree), M — mean anomaly (degree), a — semi-major axis (meter), e — eccentricity, Long. — objects Greenwich longitude (degree East), Arc — length of the orbital arc (day) at which the orbital elements were computed and the rms (O—C) residuals in R.A. and Decl. at this orbital arc. To provide a reference between observations and orbital elements, the orbital arc number is assigned in the first column of Tables 2 and 3 and given in the first column of Tables 4 and 5. The large residuals at some orbital arcs are due to the orbital manoeuvres splitting the arcs involved.

#### SATELLITE IDENTIFICATION

Object identification has been also pursued independently by two groups mentioned above. The results were compared afterwards and discussed. The results of one group were complemented by the results of another one. The final results are presented in the paper.

The first group identified the satellites by the orbital inclination, longitude of the ascending node, both referred to the Laplace plane, objects Greenwich longitude and longitude drift using the method (Kirichenko & Klimik 1994). Four catalogues of the orbital elements of the geostationary satellites (Sochilina et al. 1996; Vershkov 1996; Log of objects, Aug. 1995 & Feb. 1996) were used.

Satellite identification was also performed by another group on the basis of the objects Greenwich longitude, orbital inclination and longitude of the ascending node, both referred to the true-of-date Earth's equatorial plane. As the source of the orbital information the following catalogues were used: NASA Two-Line Elements Electronic Catalogues (at the epochs: June 12, August 2, 16, 23, 30, November 1, 1996), ESA/ESOC's catalogues (Log of objects, Feb. 1996) and the catalogue (Sochilina et al. 1996).

While identifying the collocated controlled satellites with orbital inclination  $i < 0.1^\circ$ , a problem was met to which of the satellites given in a catalogue the observations should be related. This situation takes place for the objects at such longitudes (figure in brackets shows the number of objects at the respective longitude): 13.0 (3), 19.2 (6), 57.0 (2), 60.0 (2), 62.9 (2), 330.0 (2), 338.6 (2), 341.2 (2), 356.0 (2), 359.0° E (2). When there is no orbital manoeuvre between the epoch of the orbital elements from a catalogue and the epoch of observations the problem can be reliably solved by predicting satellite position at the instants of observations using the orbital elements from the catalogue and by comparing the

observed and predicted positions. However, it is difficult to identify precisely the collocated satellites having the catalogues with the epoch separated in some cases by a few weeks or months from the time of observation while the orbital manoeuvres of some satellites occur with 7–15 day period.

Detecting objects not present in the NASA TLE Catalogue. A few objects not present in this Catalogue have been detected. Orbital analysis shows that they are controlled satellites collocated with the other satellites which elements are present in the NASA Catalogue. They are located at the following longitudes (figures in brackets provides the orbital arc number, see Tables 2–5): 16.3 (1381), 56.9 (1091–1093), 60.0 (1071–1076), 62.9 (1031), 347.9 (1581), 356.0 (1511), 356.0° E (1521–1523). Observations of some of them can be found in the previous surveys (Demchyk et al. 1996). Another uncontrolled object which orbit is not given in the NASA TLE Catalogue was also detected at the longitude 18.0–15.0° E (1351).

## CONCLUSIONS

The observations presented in the paper can be used to update the catalogues of orbits of geostationary satellites, to identify objects more precisely by combining our observations with those obtained at other stations. The orbital elements of some passive objects revealed in this study can be used to predict their long-term ephemerides. The data listed in Tables 1–5 can be obtained in the electronic form by request to the authors (e-mail: rudenko@mao.kiev.ua or kizyun@mao.kiev.ua).

Acknowledgements. We would like to thank the referee for careful review of the paper.

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TABLE 1. NUMBER OF IDENTIFIED AND UNIDENTIFIED GEOSYNCHRONOUS OBJECTS DERIVED BY OBSERVATIONS IN KIEV AND UZHGOROD IN 1996

Object type	Kyiv	Uzhgorod
Identified:		
controlled	26	56
librating	0	5
drifting	2	20
Unidentified		
controlled	6	0
librating	0	0
drifting	1	0
unknown type	24	43
Totally	59	124

TABLE 2. RESULTS OF GEOSYNCHRONOUS SATELLITES OBSERVATIONS IN KYIV IN 1996

Orbit. arc number	Date 1996	UTC h m s	RA 2000 h m s	D 2000 ° ′ ″
90093A Intarsat 2 F-1 (c) L = 64.5				
1011	10.02	20 45 30.941	10 38 12.727	-06 55 49.78 *
1011	25.02	18 39 25.448	09 30 40.156	-06 22 06.24
1011	25.02	19 10 18.925	10 01 36.333	-06 37 14.98
1011	25.02	19 40 53.620	10 32 13.606	-06 52 04.33
XXXXX L = 64.6				
1021	16.03	19 04 51.539	11 15 09.326	-07 11 58.46
XXXXX L = 62.9				
1031	05.10	17 59 47.258	23 23 25.696	-07 20 13.44
1031	05.10	18 31 02.522	23 54 47.326	-07 21 07.80
1031	05.10	20 33 27.043	01 57 27.265	-07 22 48.83
1031	05.10	22 45 37.119	04 09 34.850	-07 20 51.45
89087A Intelsat 6 F-2 (c) L = 62.9				
1041	18.01	19 01 58.135	07 16 31.715	-07 09 55.85
1041	18.01	20 52 32.747	09 07 23.404	-07 10 17.64
1042	10.02	20 45 30.941	10 30 59.146	-07 11 41.56
1042	10.02	22 23 04.548	12 08 47.788	-07 11 40.33
1042	25.02	18 39 25.448	09 23 37.229	-07 11 59.39
1042	25.02	19 10 18.925	09 54 35.508	-07 11 55.47
1042	25.02	19 40 53.620	10 25 15.095	-07 11 54.01 *
1043	16.03	19 04 51.539	11 08 02.869	-07 11 45.01
1043	17.03	18 12 35.750	10 19 35.868	-07 12 01.98
1043	18.03	18 02 18.630	10 13 13.012	-07 12 04.52 *
1044	13.05	19 53 06.980	15 45 19.299	-07 12 20.01
1044	13.05	20 59 31.232	16 51 54.988	-07 11 59.11 *
1044	15.05	19 41 23.496	15 41 26.272	-07 13 28.70
1044	15.05	20 49 01.798	16 49 16.624	-07 12 43.41 *
1045	14.07	20 24 09.965	20 20 57.224	-07 11 58.84
1045	14.07	22 02 48.128	21 59 49.166	-07 11 28.95 *
1046	05.10	17 59 47.258	23 23 24.025	-07 08 47.23
1046	05.10	18 31 02.522	23 54 44.199	-07 08 52.31
1046	05.10	20 33 27.043	01 57 26.719	-07 09 38.05
1046	05.10	22 45 37.119	04 09 54.745	-07 10 54.46
80018A Ayame 2 (d3) L = 60.4				
1051	14.07	20 24 09.965	20 09 42.943	-08 20 48.67
1051	14.07	20 39 40.150	20 25 21.965	-08 24 42.95
90056A Intelsat 6 F-4 (c) L = 60.0				
1061	18.01	19 01 58.135	07 04 01.593	-07 11 07.59
1061	18.01	19 18 51.456	07 20 57.510	-07 11 08.27
1061	18.01	20 52 32.747	08 54 53.500	-07 11 22.92
1061	18.01	21 07 34.870	09 09 57.748	-07 11 25.24 *
1062	10.02	20 45 30.941	10 18 35.580	-07 09 24.66
1062	10.02	21 01 55.525	10 34 58.485	-07 09 14.63
1062	10.02	22 23 04.548	11 56 16.966	-07 08 48.06 *
1062	25.02	18 39 25.448	09 11 04.831	-07 13 10.45
1062	25.02	18 53 53.715	09 25 35.256	-07 13 10.49
1062	25.02	19 10 18.925	09 42 03.021	-07 13 07.84
1062	25.02	19 26 16.525	09 58 02.989	-07 13 06.66
1062	25.02	19 40 53.620	10 12 42.539	-07 13 04.98
1062	25.02	19 55 58.345	10 27 49.953	-07 13 00.69
1063	16.03	19 04 51.539	10 55 26.266	-07 12 55.06
1063	16.03	19 19 27.268	11 10 04.405	-07 12 51.75
1063	17.03	17 54 31.037	09 48 51.903	-07 13 18.78
1063	17.03	18 12 35.750	10 06 59.679	-07 13 12.77
1063	17.03	18 30 29.278	10 24 56.305	-07 13 05.90

TABLE 2 (continued)

Orbit, arc number	Date 1996	UTC h m s	RA 2000	D 2000
			h m s	° ′ ″
1063	18.03	18 02 18.630	10 00 37.077	-07 13 15.68
1063	18.03	18 17 20.753	10 15 41.815	-07 13 10.42 *
1064	13.05	19 53 06.980	15 32 41.768	-07 13 43.12
1064	13.05	20 09 08.031	15 48 45.487	-07 13 39.77
1064	13.05	20 59 31.232	16 39 16.824	-07 13 19.35
1064	13.05	21 14 43.145	16 54 31.104	-07 13 15.61 *
1064	15.05	19 41 23.496	15 28 49.359	-07 14 57.38
1064	15.05	19 57 23.022	15 44 51.519	-07 14 46.15
1064	15.05	20 49 01.798	16 36 38.978	-07 14 11.20
1064	15.05	21 04 03.245	16 51 42.955	-07 13 58.68 *
1065	14.07	20 24 09.965	20 08 22.260	-07 13 12.63
1065	14.07	20 39 40.150	20 23 54.775	-07 13 07.69
1065	14.07	22 02 48.128	21 47 15.108	-07 12 39.29
1065	14.07	22 17 46.354	22 02 15.402	-07 12 33.49 *
1066	05.10	17 59 47.258	23 10 45.409	-07 09 48.40
1066	05.10	18 31 02.522	23 42 04.983	-07 09 51.96
1066	05.10	20 33 27.043	01 44 45.114	-07 10 36.12
1066	05.10	22 45 37.119	03 57 11.112	-07 11 57.02
1066	05.10	18 46 11.445	23 57 15.898	-07 09 55.03
1066	05.10	19 02 46.005	00 13 52.694	-07 10 00.00
1066	05.10	20 48 08.234	01 59 28.057	-07 10 43.15
1066	05.10	23 00 06.148	04 11 41.978	-07 12 05.96
		XXXXX(c) L = 60.0		
1071	18.01	19 01 58.135	07 03 58.754	-07 11 25.78
1071	18.01	19 18 51.456	07 20 55.297	-07 11 26.20
1071	18.01	20 52 32.747	08 54 51.883	-07 11 24.42
1071	18.01	21 07 34.870	09 9 56.071	-07 11 24.51 *
1072	10.02	20 45 30.941	10 18 24.362	-07 12 52.08
1072	10.02	21 01 55.525	10 34 47.842	-07 12 50.38
1072	10.02	22 23 04.548	11 56 09.899	-07 12 46.34 *
1072	25.02	18 39 25.448	09 10 53.442	-07 17 41.63
1072	25.02	18 53 53.715	09 25 23.749	-07 17 56.46
1072	25.02	19 10 18.925	09 41 51.335	-07 18 10.32
1072	25.02	19 26 16.525	09 57 51.191	-07 18 23.55
1072	25.02	19 40 53.620	10 12 30.537	-07 18 33.70
1072	25.02	19 55 58.345	10 27 37.809	-07 18 40.49 *
1073	16.03	19 04 51.539	10 55 24.870	-07 17 01.91
1073	16.03	19 19 27.268	11 10 03.076	-07 17 03.44
1073	17.03	17 54 31.037	09 48 50.622	-07 16 53.55
1073	17.03	18 12 35.750	10 06 58.436	-07 16 58.31
1073	17.03	18 30 29.278	10 24 54.886	-07 17 01.53
1073	18.03	18 02 18.630	10 00 35.787	-07 16 57.86
1073	18.03	18 17 20.753	10 15 40.396	-07 17 00.86 *
1074	13.05	19 53 06.980	15 32 34.666	-07 17 02.69
1074	13.05	20 09 08.031	15 48 38.252	-07 16 41.47
1074	13.05	20 59 31.232	16 39 09.387	-07 15 20.54
1074	13.05	21 14 43.145	16 54 23.657	-07 14 57.85
1074	15.05	19 41 23.496	15 28 46.813	-07 17 12.13
1074	15.05	19 57 23.022	15 44 49.029	-07 16 50.72
1074	15.05	20 49 01.798	16 36 36.290	-07 15 36.84
1074	15.05	21 04 03.245	16 51 40.058	-07 15 12.15 *
1075	14.07	20 24 09.965	20 07 35.596	-07 10 29.96
1075	14.07	20 39 40.150	20 23 08.204	-07 10 05.79
1075	14.07	22 02 48.128	21 46 29.598	-07 08 16.07
1075	14.07	22 17 46.354	22 01 29.982	-07 07 57.85 *
1076	05.10	17 59 47.258	23 10 33.970	-07 15 24.95
1076	05.10	18 31 02.522	23 41 53.871	-07 15 37.00
1076	05.10	19 19 12.731	00 30 10.981	-07 15 49.14

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC	RA 2000	D 2000
		<i>h m s</i>	<i>h m s</i>	* * *
1076	05.10	20 33 27.043	01 44 35.659	-07 15 50.59
1076	05.10	22 45 37.119	03 57 03.536	-07 15 00.21
1076	05.10	18 46 11.445	23 57 04.986	-07 15 41.77
1076	05.10	19 02 46.005	00 13 41.977	-07 15 45.66
1076	05.10	20 48 08.234	01 59 18.868	-07 15 47.45
1076	05.10	23 00 06.148	04 11 34.589	-07 14 51.12
		XXXXXX (c) <i>L</i> = 57.0		
1081	18.01	19 18 51.456	07 07 55.089	-07 15 27.72
1081	18.01	21 07 34.870	08 56 54.855	-07 17 59.44
1082	10.02	21 01 55.525	10 21 34.564	-07 17 09.44
1082	25.02	18 53 53.715	09 12 40.840	-07 15 56.71
1082	25.02	19 26 16.525	09 45 08.387	-07 15 50.70
1082	25.02	19 56 58.345	10 14 54.784	-07 15 40.36
1083	13.05	20 09 08.031	15 35 21.935	-07 16 50.40
1083	13.05	21 14 43.145	16 41 07.271	-07 15 28.43
1083	15.05	19 57 23.022	15 31 22.572	-07 16 59.85
1083	15.05	21 04 03.245	16 38 13.485	-07 15 40.33
1084	14.07	20 39 40.150	20 10 50.225	-07 17 03.66
1084	14.07	22 17 46.354	21 49 11.948	-07 18 20.41
		94064A Intelsat 703 (c) <i>L</i> = 57.0		
1085	05.10	18 46 11.445	23 44 10.651	-07 11 42.89
1085	05.10	19 02 46.005	00 00 47.921	-07 11 46.60
1085	05.10	20 48 08.234	01 46 25.623	-07 12 22.39
1085	05.10	23 00 06.148	03 58 40.958	-07 13 29.44
		XXXXXX (c) <i>L</i> = 57.0		
1091	16.03	19 19 27.268	10 56 31.383	-07 13 35.07
1091	17.03	17 54 31.037	09 35 19.489	-07 14 35.27
1091	17.03	18 30 29.278	10 11 23.409	-07 14 08.26
1091	18.03	18 17 20.753	10 02 08.785	-07 14 17.48
1092	14.07	20 39 40.150	20 10 42.872	-07 14 58.98
1092	14.07	22 17 46.354	21 49 04.898	-07 14 44.03
1093	05.10	18 46 11.445	23 44 09.378	-07 06 36.49
1093	05.10	19 02 46.005	00 00 46.439	-07 06 36.41
1093	05.10	20 48 08.234	01 46 22.996	-07 07 33.30
1093	05.10	23 00 06.148	03 58 37.990	-07 10 26.92
		85025A Intelsat 5a f-10 (c) <i>L</i> = 57.0		
1101	25.02	18 53 53.715	09 12 25.561	-04 22 50.85
1101	25.02	19 26 16.525	09 44 54.616	-04 13 34.70
		XXXXXX <i>L</i> = 55.5		
1111	10.02	21 01 55.525	10 15 12.098	-07 10 09.22
		XXXXXX <i>L</i> = 54.7		
1121	14.07	20 39 40.150	20 00 32.805	-07 14 41.53
1121	14.07	22 17 46.354	21 38 48.657	-07 04 09.02
		92010B Arabsat 1C (c) <i>L</i> = 30.9		
1131	13.05	20 25 15.463	13 56 30.755	-07 14 24.22
1131	13.05	21 49 26.903	15 20 52.366	-07 15 12.93
1131	13.05	23 21 23.330	16 53 01.587	-07 16 37.12
		90063B Dfs 2 (Copernicus 2) (c) <i>L</i> = 28.5		
1141	13.05	20 25 15.463	13 46 05.737	-07 23 06.62
1141	13.05	21 49 26.903	15 10 28.737	-07 22 13.53
1141	13.05	23 21 23.330	16 42 37.107	-07 20 45.93
		XXXXXX <i>L</i> = 23.6		
1151	15.05	20 15 42.039	13 22 31.203	-07 19 54.81
		92066A Dfs 3 (Copernicus 3) (c) <i>L</i> = 23.5		
1161	18.01	19 37 09.999	04 58 20.687	-07 17 32.98
1162	10.02	21 18 29.295	08 10 39.877	-07 18 52.78
1162	10.02	22 38 48.592	09 31 09.220	-07 18 55.24
1162	18.02	22 12 07.204	09 36 01.151	-07 20 18.18

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC	RA 2000	D 2000
		h m s	h m s	* * *
1162	18.02	23 24 54.951	10 48 58.589	-07 20 18.58
1162	19.02	00 36 19.992	12 00 33.318	-07 20 08.30 *
1163	17.03	18 51 22.808	08 05 08.155	-07 20 34.04
1163	17.03	20 49 01.771	10 03 04.144	-07 20 27.12 *
1163	18.03	18 37 49.974	07 55 30.615	-07 21 50.50
1163	18.03	19 13 37.892	08 31 23.796	-07 22 10.15
1163	18.03	19 29 06.410	08 46 54.495	-07 22 16.39
1163	18.03	19 44 10.804	09 02 01.044	-07 22 22.91
1163	18.03	20 01 44.321	09 19 37.120	-07 22 28.36
1163	18.03	20 18 51.270	09 36 46.363	-07 22 32.58
1163	18.03	20 34 34.969	09 52 32.297	-07 22 35.54
1163	18.03	20 49 39.450	10 07 38.859	-07 22 36.40
1163	18.03	21 03 50.983	10 21 52.356	-07 22 35.88
1163	18.03	21 18 10.783	10 36 14.195	-07 22 35.49
1163	18.03	21 49 07.847	11 07 15.513	-07 22 28.46 *
1164	13.05	20 42 52.028	13 41 39.637	-07 23 36.69
1164	13.05	22 05 46.019	15 04 44.631	-07 22 29.08
1164	13.05	23 38 18.894	16 37 29.476	-07 20 35.19
1164	15.05	20 15 42.039	13 22 16.489	-07 23 42.44
1164	15.05	22 09 17.285	15 16 07.240	-07 22 21.35 *
1165	23.06	20 39 04.512	16 19 28.433	-07 20 15.71
1165	23.06	22 11 36.668	17 52 12.163	-07 20 08.25
1165	23.06	23 18 47.296	18 59 31.100	-07 19 51.77
1165	24.06	21 39 39.365	17 24 08.585	-07 20 12.95 *
1166	14.07	20 57 01.217	18 00 15.487	-07 19 57.28
1166	15.07	20 37 42.043	17 44 49.217	-07 19 42.89 *
1167	05.10	19 41 44.859	22 12 06.131	-07 13 59.44
1167	05.10	21 07 39.878	23 38 12.354	-07 13 56.81
1167	11.10	19 57 57.781	22 51 59.963	-07 14 08.74
1167	11.10	21 05 38.369	23 59 49.523	-07 14 18.91
1167	11.10	22 55 54.847	01 50 20.384	-07 15 22.44
		XXXXXX L = 23.5		
1171	14.07	22 34 08.667	19 37 35.835	-07 20 40.76
		XXXXXX L = 23.5		
1181	15.05	22 09 17.285	15 15 58.536	-07 19 40.05
		XXXXXX L = 22.2		
1191	15.07	20 37 42.043	17 39 00.288	-08 02 33.44
		XXXXXX L = 21.5		
1201	11.10	22 55 54.847	01 41 29.573	-08 51 40.18
		88063B Ecs 5 (c) L = 21.5		
1211	10.02	22 38 48.592	09 22 08.582	-05 53 20.32
1211	18.02	22 12 07.204	09 26 56.449	-05 51 32.45
1211	18.02	23 24 54.951	10 39 55.439	-05 43 37.40
1211	19.02	00 36 19.992	11 51 31.855	-05 44 52.46
		XXXXXX L = 20.3		
1221	15.07	20 37 42.043	17 30 22.616	-07 20 48.92
		83077A Telstar 3A(c) L = 20.0		
1231	18.02	22 12 07.204	09 20 32.429	-05 26 13.23
1231	18.02	23 24 54.951	10 33 34.383	-05 16 08.72
1231	19.02	00 36 19.992	11 45 13.799	-05 18 16.77
		XXXXXX L = 19.3		
1241	17.03	18 51 22.808	07 46 25.037	-07 16 08.48
		93031A Astra 1C (c) L = 19.2		
1251	18.01	19 37 09.999	04 39 37.267	-07 13 31.60
1251	18.01	19 52 59.088	04 55 29.359	-07 13 26.04 *
1252	10.02	21 18 29.295	07 51 45.529	-07 14 34.16
1252	10.02	21 33 54.937	08 07 13.137	-07 14 36.66
1252	10.02	22 38 48.592	09 12 14.775	-07 14 56.63

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC	RA 2000	DEC 2000
		h m s	h m s	* ″ ″
1252	18.02	22 12 07.204	09 17 05.313	-07 16 38.61
1252	18.02	22 31 11.390	09 36 12.634	-07 16 35.54
1252	18.02	23 24 54.951	10 30 00.403	-07 16 48.80
1252	18.02	23 45 04.806	10 50 12.666	-07 17 02.26
1252	19.02	00 36 19.992	11 41 33.382	-07 17 34.92
1252	19.02	00 50 56.913	11 56 11.923	-07 17 45.49
1253	17.03	20 49 01.771	09 44 10.571	-07 18 46.78
1253	17.03	21 07 38.571	10 02 49.186	-07 18 46.86
1253	17.03	21 54 48.545	10 50 08.627	-07 18 38.16
1253	18.03	18 37 49.974	07 36 35.439	-07 17 15.51
1253	18.03	19 13 37.892	08 12 28.371	-07 17 38.85
1253	18.03	19 29 06.410	08 27 58.890	-07 17 48.23
1253	18.03	19 44 10.804	08 43 05.324	-07 17 57.40
1253	18.03	20 01 44.321	09 00 41.027	-07 18 09.30
1253	18.03	20 18 51.270	09 17 50.124	-07 18 20.04
1253	18.03	20 34 34.969	09 33 35.802	-07 18 29.34
1253	18.03	20 49 39.450	09 48 42.095	-07 18 39.92
1253	18.03	21 03 50.983	10 03 00.778	-07 18 45.77
1253	18.03	21 18 10.783	10 17 23.113	-07 18 44.02
1253	18.03	21 49 07.847	10 48 25.469	-07 18 37.95
1254	13.05	20 42 52.028	13 22 36.995	-07 18 53.61
1254	13.05	21 30 30.308	14 10 22.063	-07 18 52.99
1254	13.05	22 05 46.019	14 45 42.640	-07 18 54.09
1254	13.05	23 01 46.208	15 41 50.190	-07 18 47.10
1254	13.05	23 38 18.894	16 18 27.288	-07 18 43.63
1254	15.05	20 15 42.039	13 03 12.106	-07 18 46.11
1254	15.05	20 32 47.422	13 20 20.073	-07 18 47.82
1254	15.05	22 09 17.285	14 57 03.972	-07 18 55.66
1254	15.05	22 25 28.829	15 13 17.457	-07 18 56.56
1255	23.06	20 39 04.512	16 00 37.606	-07 19 09.69
1255	23.06	20 57 52.841	16 19 28.164	-07 19 16.71
1255	23.06	22 11 36.668	17 33 22.634	-07 18 55.79
1255	23.06	22 26 37.382	17 48 25.399	-07 18 50.60
1255	23.06	23 18 47.296	18 40 42.173	-07 18 29.70
1255	23.06	23 35 18.651	18 57 15.579	-07 18 23.24
1255	24.06	21 39 39.365	17 05 16.236	-07 19 05.83
1255	24.06	22 05 54.773	17 31 35.141	-07 18 57.50
1256	14.07	20 57 01.217	17 41 21.898	-07 18 57.79
1256	14.07	21 12 19.542	17 56 42.415	-07 18 49.42
1256	14.07	22 34 08.667	19 18 48.073	-07 17 59.49
1256	14.07	22 49 29.953	19 34 06.403	-07 17 53.43
1256	14.07	23 35 31.224	20 20 13.364	-07 17 26.10
1256	14.07	23 50 58.663	20 35 42.632	-07 17 17.52
1256	15.07	20 37 42.043	17 25 55.583	-07 18 59.25
1256	15.07	20 56 01.328	17 44 19.169	-07 18 49.76
1257	05.10	19 41 44.859	21 53 16.764	-07 15 32.93
1257	05.10	19 57 48.525	22 09 22.578	-07 15 28.71
1257	05.10	20 14 16.560	22 25 52.942	-07 15 25.98
1257	05.10	21 07 39.878	23 19 23.345	-07 15 19.62
1257	05.10	21 25 15.666	23 37 01.223	-07 15 20.37
1257	11.10	17 47 17.052	20 22 06.170	-07 16 10.58
1257	11.10	18 04 47.995	20 39 40.012	-07 16 04.63
1257	11.10	19 41 19.913	22 16 27.013	-07 15 40.58
1257	11.10	19 57 57.781	22 33 07.186	-07 15 39.19
1257	11.10	20 47 04.487	23 22 20.644	-07 15 36.54
1257	11.10	21 05 38.369	23 40 56.911	-07 15 38.80
1257	11.10	21 54 31.160	00 29 55.715	-07 15 44.73
1257	11.10	22 55 54.847	01 31 15.184	-07 15 33.44

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC	RA 2000	D 2000
		h m s	h m s	* † ‡
94070A Astra 1D (c) L = 19.2				
1261	18.01	19 37 09.999	04 39 29.503	-07 12 57.09
1261	18.01	19 52 59.088	04 55 20.823	-07 13 00.75 *
1262	10.02	21 18 29.295	07 51 37.932	-07 17 21.24
1262	10.02	21 33 54.937	08 07 05.226	-07 17 39.01
1262	18.02	22 12 07.204	09 17 03.983	-07 16 08.51
1262	18.02	22 31 11.390	09 36 10.491	-07 16 17.19
1262	18.02	23 24 54.951	10 30 05.017	-07 16 31.47
1262	18.02	23 45 04.806	10 50 18.261	-07 16 31.64
1262	19.02	00 36 19.992	11 41 41.265	-07 16 32.97
1262	19.02	00 50 56.913	11 56 20.402	-07 16 35.02 *
1263	17.03	18 51 22.808	07 46 15.826	-07 17 19.34
1263	17.03	19 08 52.889	08 03 48.366	-07 17 29.84
1263	17.03	20 49 01.771	09 44 10.325	-07 18 35.66
1263	17.03	21 07 38.571	10 02 50.544	-07 18 44.69
1263	17.03	21 54 48.545	10 50 04.653	-07 19 14.39
1263	18.03	18 37 49.974	07 36 32.777	-07 18 52.08
1263	18.03	19 13 37.892	08 12 27.454	-07 18 54.10
1263	18.03	19 29 06.410	08 27 59.013	-07 18 53.31
1263	18.03	19 44 10.804	08 43 06.182	-07 18 52.83
1263	18.03	20 01 44.321	09 00 42.931	-07 18 51.74
1263	18.03	20 18 51.270	09 17 52.990	-07 18 50.38
1263	18.03	20 34 34.969	09 33 39.593	-07 18 48.34
1263	18.03	20 49 39.450	09 48 46.702	-07 18 48.18
1263	18.03	21 03 50.983	10 02 55.322	-07 18 48.07
1263	18.03	21 18 10.783	10 17 16.866	-07 18 56.84
1263	18.03	21 49 07.847	10 48 17.520	-07 19 12.72 *
1264	13.05	20 42 52.028	13 22 31.522	-07 20 31.34
1264	13.05	21 30 30.308	14 10 18.111	-07 20 11.25
1264	13.05	22 05 46.019	14 45 39.936	-07 19 54.64
1264	13.05	23 01 46.208	15 41 49.406	-07 19 20.59
1264	13.05	23 38 18.894	16 18 27.835	-07 18 55.27
1264	15.05	20 15 42.039	13 03 08.248	-07 20 31.73
1264	15.05	20 32 47.422	13 20 16.636	-07 20 27.28
1264	15.05	22 25 28.829	15 13 17.849	-07 19 43.66 *
1265	23.06	22 11 36.668	17 33 20.192	-07 19 29.37
1265	23.06	22 26 37.382	17 48 22.455	-07 19 31.15
1265	23.06	23 18 47.296	18 40 36.294	-07 19 10.22
1265	23.06	23 35 18.651	18 57 10.356	-07 18 40.63
1265	24.06	21 39 39.365	17 05 13.848	-07 19 24.63
1265	24.06	22 05 54.773	17 31 31.941	-07 19 29.93 *
1266	14.07	20 57 01.217	17 41 19.055	-07 19 26.23
1266	14.07	21 12 19.542	17 56 39.165	-07 19 36.57
1266	14.07	22 34 08.667	19 18 31.881	-07 20 04.76
1266	14.07	22 49 29.953	19 34 00.503	-07 20 26.04
1266	14.07	23 35 31.224	20 20 06.654	-07 20 42.13
1266	14.07	23 50 58.663	20 35 31.501	-07 20 39.59
1266	15.07	20 37 42.043	17 25 52.375	-07 19 07.75
1266	15.07	20 56 01.328	17 44 15.418	-07 19 21.54 *
1267	05.10	19 41 44.859	21 53 07.907	-07 16 39.29
1267	05.10	19 57 48.525	22 09 14.261	-07 16 28.10
1267	05.10	20 14 16.560	22 25 39.166	-07 16 28.87
1267	05.10	21 07 39.878	23 19 08.401	-07 16 43.26
1267	05.10	21 25 15.666	23 36 45.921	-07 16 49.56
1267	11.10	19 41 19.913	22 16 22.858	-07 16 38.17
1267	11.10	19 57 57.781	22 33 02.556	-07 16 44.04
1267	11.10	20 47 04.487	23 22 14.697	-07 17 00.83
1267	11.10	21 05 38.369	23 40 50.656	-07 17 06.72

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC	RA 2000	D 2000
		h m s	h m s	° ′ ″
1267	11.10	21 54 31.160	00 29 50.206	-07 17 18.52
1267	11.10	22 55 54.847	01 31 18.637	-07 17 50.91
		95055A Astra 1E (c) L = 19.2		
1271	18.01	19 37 09.999	04 39 27.795	-07 16 15.26
1271	18.01	19 52 59.088	04 55 20.072	-07 15 55.28
1272	10.02	21 18 29.295	07 51 37.561	-07 19 19.95
1272	10.02	21 33 54.937	08 07 04.994	-07 19 35.18
1272	10.02	22 38 48.592	09 12 06.642	-07 20 35.07
1272	18.02	22 12 07.204	09 16 56.730	-07 21 39.78
1272	18.02	22 31 11.390	09 36 03.439	-07 21 53.82
1272	18.02	23 24 54.951	10 29 54.966	-07 22 26.47
1272	18.02	23 45 04.806	10 50 07.950	-07 22 35.45
1272	19.02	00 36 19.992	11 41 30.957	-07 22 46.29
1272	19.02	00 50 56.913	11 56 10.294	-07 22 47.61
1273	17.03	18 51 22.808	07 46 10.820	-07 17 59.33
1273	17.03	19 08 52.889	08 03 36.039	-07 19 13.90
1273	17.03	20 49 01.771	09 44 00.618	-07 21 01.37
1273	17.03	21 07 38.571	10 02 40.550	-07 20 59.53
1273	17.03	21 54 48.545	10 49 58.867	-07 20 51.16
1273	18.03	19 13 37.892	08 12 19.136	-07 19 24.31
1273	18.03	19 29 06.410	08 27 49.426	-07 19 40.12
1273	18.03	19 44 10.804	08 42 55.511	-07 19 54.97
1273	18.03	20 01 44.321	09 00 31.038	-07 20 12.20
1273	18.03	20 18 51.270	09 17 39.886	-07 20 28.12
1273	18.03	20 34 34.969	09 33 25.534	-07 20 41.26
1273	18.03	20 49 39.450	09 48 31.694	-07 20 55.10
1273	18.03	21 03 50.983	10 02 46.359	-07 21 01.15
1273	18.03	21 18 10.783	10 17 08.760	-07 20 59.35
1273	18.03	21 49 07.847	10 48 11.303	-07 20 51.61
1274	13.05	20 42 52.028	13 22 27.894	-07 24 16.85
1274	13.05	21 30 30.308	14 10 14.353	-07 23 47.20
1274	13.05	22 05 46.019	14 45 36.342	-07 23 17.39
1274	15.05	20 15 42.039	13 03 11.159	-07 24 18.37
1274	15.05	20 32 47.422	13 20 19.492	-07 24 12.98
1274	15.05	22 09 17.285	14 57 06.712	-07 23 08.50
1274	15.05	22 25 28.829	15 13 19.342	-07 23 26.59
1275	23.06	20 39 04.512	16 00 27.404	-07 21 34.66
1275	23.06	20 57 52.841	16 19 18.954	-07 21 21.49
1275	23.06	22 11 36.668	17 33 15.026	-07 20 13.38
1275	23.06	22 26 37.382	17 48 18.194	-07 19 59.28
1275	23.06	23 18 47.296	18 40 37.725	-07 19 34.18
1275	23.06	23 35 18.651	18 57 10.759	-07 19 33.83
1275	24.06	21 39 39.365	17 05 10.163	-07 20 42.20
1275	24.06	22 05 54.773	17 31 29.832	-07 20 17.93
1276	14.07	20 57 01.217	17 41 14.006	-07 20 03.79
1276	14.07	21 12 19.542	17 56 34.877	-07 19 48.70
1276	14.07	22 34 08.667	19 18 43.119	-07 18 02.31
1276	14.07	22 49 29.953	19 34 01.598	-07 18 05.32
1276	15.07	20 37 42.043	17 25 45.362	-07 20 11.10
1276	15.07	20 56 01.328	17 44 09.367	-07 19 54.42
1277	05.10	19 41 44.859	21 53 03.895	-07 16 22.41
1277	05.10	19 57 48.525	22 09 09.183	-07 16 26.01
1277	05.10	20 14 16.560	22 25 45.038	-07 16 20.13
1277	05.10	21 07 39.878	23 19 17.181	-07 15 52.89
1277	05.10	21 25 15.666	23 36 55.654	-07 15 45.65
1277	11.10	19 41 19.913	22 16 09.107	-07 16 38.38
1277	11.10	19 57 57.781	22 32 49.873	-07 16 29.86
1277	11.10	20 47 04.487	23 22 04.879	-07 16 08.56

TABLE 2 (continued)

Orbit. arc number	Date	UTC	RA 2000	D 2000
		1996 h m s	h m s	* * *
1277	11.10	21 05 38.369	23 40 41.850	-07 16 01.25
1277	11.10	21 54 31.160	00 29 42.484	-07 15 45.19
1277	11.10	22 55 54.847	01 31 26.466	-07 16 00.59
91015A Astra 1B (c) L = 19.2				
1281	18.01	19 37 09.999	04 39 19.937	-07 14 43.92
1281	18.01	19 52 59.088	04 55 11.049	-07 14 52.01 *
1282	10.02	21 18 29.295	07 51 36.853	-07 15 46.17
1282	10.02	21 33 54.937	08 07 05.006	-07 15 40.81
1282	10.02	22 38 48.592	09 12 09.001	-07 15 23.35
1282	18.02	22 12 07.204	09 16 55.262	-07 18 52.45
1282	18.02	22 31 11.390	09 36 02.666	-07 18 50.57
1282	18.02	23 24 54.951	10 29 55.601	-07 18 45.14
1282	18.02	23 45 04.806	10 50 09.139	-07 18 42.95
1282	19.02	00 36 19.992	11 41 33.315	-07 18 33.12
1282	19.02	00 50 56.913	11 56 12.868	-07 18 31.29 *
1283	17.03	18 51 22.808	07 46 10.082	-07 18 51.70
1283	17.03	19 08 52.889	08 03 42.971	-07 18 51.22
1283	17.03	20 49 01.771	09 43 56.655	-07 20 49.34
1283	17.03	21 07 38.571	10 02 35.571	-07 21 04.00
1283	17.03	21 54 48.545	10 49 51.164	-07 21 35.41
1283	18.03	18 37 49.974	07 36 20.607	-07 20 33.01
1283	18.03	19 29 06.410	08 27 45.270	-07 20 55.10
1283	18.03	19 44 10.804	08 42 52.218	-07 20 58.19
1283	18.03	20 01 44.321	09 00 28.787	-07 21 00.89
1283	18.03	20 18 51.270	09 17 38.669	-07 21 02.10
1283	18.03	20 34 34.969	09 33 25.185	-07 21 02.08
1283	18.03	20 49 39.450	09 48 32.322	-07 21 02.63
1283	18.03	21 03 50.983	10 02 44.866	-07 21 05.59
1283	18.03	21 18 10.783	10 17 06.422	-07 21 16.14
1283	18.03	21 49 07.847	10 48 07.163	-07 21 34.57 *
1284	13.05	20 42 52.028	13 22 26.275	-07 21 22.56
1284	13.05	21 30 30.308	14 10 09.979	-07 21 44.02
1284	13.05	22 05 46.019	14 45 29.682	-07 21 55.53
1284	13.05	23 01 46.208	15 41 36.527	-07 21 59.62
1284	13.05	23 38 18.894	16 18 13.627	-07 21 54.91
1284	15.05	20 15 42.039	13 03 04.568	-07 21 04.94
1284	15.05	20 32 47.422	13 20 11.842	-07 21 15.57
1284	15.05	22 09 17.285	14 56 53.243	-07 22 00.83
1284	15.05	22 25 28.829	15 13 06.635	-07 22 04.99 *
1285	23.06	20 39 04.512	16 00 28.470	-07 20 33.61
1285	23.06	20 57 52.841	16 19 18.617	-07 20 43.33
1285	23.06	22 11 36.668	17 33 09.759	-07 21 10.49
1285	23.06	22 26 37.382	17 48 11.975	-07 21 14.10
1285	23.06	23 18 47.296	18 40 27.609	-07 20 34.14
1285	23.06	23 35 18.651	18 57 01.690	-07 20 09.43
1285	24.06	21 39 39.365	17 05 03.881	-07 21 01.91
1285	24.06	22 05 54.773	17 31 21.807	-07 21 10.59 *
1286	14.07	20 57 01.217	17 41 09.652	-07 21 05.62
1286	14.07	21 12 19.542	17 56 29.701	-07 21 16.30
1286	14.07	22 34 08.667	19 18 29.521	-07 21 39.49
1286	14.07	22 49 29.953	19 33 53.161	-07 21 28.41
1286	14.07	23 35 31.224	20 20 01.633	-07 20 52.09
1286	14.07	23 50 58.663	20 35 35.765	-07 20 46.35
1286	15.07	20 37 42.043	17 25 42.601	-07 20 46.93
1286	15.07	20 56 01.328	17 44 05.558	-07 21 02.48 *
1287	05.10	19 41 44.859	21 53 00.703	-07 18 29.47
1287	05.10	19 57 48.525	22 09 07.184	-07 18 19.62
1287	05.10	20 14 16.560	22 25 38.125	-07 18 11.19

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC	RA 2000	D 2000
		h m s	h m s	* * *
1287	05.10	21 07 39.878	23 19 10.938	-07 17 40.46
1287	05.10	21 25 15.666	23 36 49.725	-07 17 30.49
1287	11.10	19 41 19.913	22 16 16.114	-07 18 26.21
1287	11.10	19 57 57.781	22 32 56.790	-07 18 18.43
1287	11.10	20 47 04.487	23 22 11.858	-07 17 53.37
1287	11.10	21 05 38.369	23 40 49.013	-07 17 43.61
1287	11.10	21 54 31.160	00 29 48.585	-07 17 26.47
1287	11.10	22 55 54.847	01 31 24.366	-07 16 48.79
88109A Astra 1B (c) L = 19.2				
1291	10.02	21 18 29.295	07 51 34.307	-07 17 47.99
1291	10.02	21 33 54.937	08 07 02.266	-07 17 47.34
1291	10.02	22 38 48.392	09 12 06.152	-07 17 38.98
1291	18.02	22 12 07.204	09 16 49.098	-07 20 07.02
1291	18.02	22 31 11.390	09 35 55.317	-07 20 27.80
1291	18.02	23 24 54.951	10 29 44.934	-07 21 21.86
1291	18.02	23 45 04.806	10 49 57.567	-07 21 39.64
1291	19.02	00 36 19.992	11 41 18.864	-07 22 14.48
1291	19.02	00 50 56.913	11 55 57.680	-07 22 23.66
1292	17.03	18 51 22.808	07 45 57.690	-07 20 45.59
1292	17.03	19 08 52.889	08 03 30.296	-07 21 02.12
1292	17.03	20 49 01.771	09 43 53.666	-07 22 12.89
1292	17.03	21 07 38.571	10 02 33.055	-07 22 20.82
1292	17.03	21 54 48.545	10 49 50.237	-07 22 32.50
1292	18.03	19 13 37.892	08 12 13.461	-07 21 12.18
1292	18.03	19 29 06.410	08 27 44.156	-07 21 24.99
1292	18.03	19 44 10.804	08 42 50.690	-07 21 36.23
1292	18.03	20 01 44.321	09 00 26.646	-07 21 49.24
1292	18.03	20 18 51.270	09 17 36.042	-07 22 00.08
1292	18.03	20 34 34.969	09 33 22.116	-07 22 08.48
1292	18.03	20 49 39.450	09 48 28.715	-07 22 16.81
1292	18.03	21 03 50.983	10 02 42.405	-07 22 21.75
1292	18.03	21 18 10.783	10 17 04.359	-07 22 26.73
1292	18.03	21 49 07.847	10 48 06.168	-07 22 31.89
1293	13.05	20 42 52.028	13 22 25.677	-07 24 45.69
1293	13.05	21 30 30.308	14 10 10.784	-07 24 36.15
1293	13.05	22 05 46.019	14 45 31.741	-07 24 19.34
1293	13.05	23 01 46.208	15 41 29.065	-07 22 43.49
1293	13.05	23 38 18.894	16 18 18.859	-07 22 49.75
1293	15.05	20 15 42.039	13 03 08.884	-07 24 39.07
1293	15.05	20 32 47.422	13 20 16.608	-07 24 41.02
1293	15.05	22 09 17.285	14 57 01.055	-07 24 14.83
1293	15.05	22 25 28.829	15 13 14.980	-07 24 03.72
1294	23.06	20 39 04.512	16 00 19.139	-07 23 24.85
1294	23.06	20 57 52.841	16 19 10.449	-07 23 11.85
1294	23.06	22 11 36.668	17 33 05.965	-07 22 00.88
1294	23.06	22 26 37.382	17 48 09.083	-07 21 43.38
1294	23.06	23 18 47.296	18 40 27.356	-07 21 17.12
1294	23.06	23 35 18.651	18 57 00.440	-07 21 16.07
1294	24.06	21 39 39.365	17 05 02.288	-07 22 30.91
1294	24.06	22 05 54.773	17 31 21.808	-07 22 04.71
1295	14.07	20 57 01.217	17 41 07.685	-07 22 20.69
1295	14.07	21 12 19.542	17 56 28.147	-07 22 16.43
1295	14.07	22 34 08.667	19 18 28.448	-07 21 59.49
1295	14.07	22 49 29.953	19 33 51.586	-07 22 03.33
1295	14.07	23 35 31.224	20 19 58.558	-07 22 10.69
1295	14.07	23 50 58.663	20 35 27.909	-07 22 11.22
1295	15.07	20 37 42.043	17 25 41.370	-07 22 19.58
1295	15.07	20 56 01.328	17 44 04.756	-07 22 14.47

TABLE 2 (continued)

Orbit arc number	Date 1996	UTC	RA 2000	DEC 2000
		h m s	h m s	* ′ ″
1296	05.10	19 41 44.859	21 52 54.498	-07 19 27.80
1296	05.10	19 57 48.525	22 09 00.199	-07 19 25.73
1296	05.10	20 14 16.560	22 25 30.631	-07 19 23.39
1296	05.10	21 07 39.878	23 19 01.563	-07 19 12.92
1296	05.10	21 25 15.666	23 36 39.851	-07 19 08.85
1296	11.10	19 41 19.913	22 16 04.116	-07 18 50.91
1296	11.10	19 57 57.781	22 32 43.945	-07 18 56.74
1296	11.10	21 05 38.369	23 40 33.169	-07 19 24.99
1296	11.10	21 54 31.160	00 29 31.728	-07 19 23.55
1296	11.10	22 55 54.847	01 31 03.305	-07 19 27.51
96021A Astra 1F (c) L = 19.2				
1301	13.05	23 38 18.894	16 18 25.462	-07 21 17.75 *
1302	23.06	20 39 04.512	16 00 24.427	-07 22 19.94
1302	23.06	20 57 52.841	16 19 14.990	-07 22 24.27
1302	23.06	22 11 36.668	17 33 07.933	-07 22 22.99
1302	23.06	22 26 37.382	17 48 10.544	-07 22 19.70
1302	23.06	23 18 47.296	18 40 27.401	-07 21 58.94
1302	23.06	23 35 18.651	18 57 01.046	-07 21 48.55
1302	24.06	21 39 39.365	17 05 01.813	-07 22 26.62
1302	24.06	22 05 54.773	17 31 20.453	-07 22 24.68 *
1303	14.07	20 57 01.217	17 41 07.677	-07 21 45.40
1303	14.07	21 12 19.542	17 56 28.534	-07 21 32.44
1303	14.07	22 34 08.667	19 18 37.608	-07 20 20.07
1303	14.07	22 49 29.953	19 33 55.778	-07 19 45.29
1303	14.07	23 35 31.224	20 20 05.118	-07 18 46.45
1303	14.07	23 50 58.663	20 35 35.209	-07 18 28.21
1303	15.07	20 37 42.043	17 25 38.443	-07 21 50.84 *
1303	15.07	20 56 01.328	17 44 02.408	-07 21 36.65 *
1304	05.10	19 41 44.859	21 52 52.927	-07 18 30.48
1304	05.10	19 57 48.525	22 08 58.266	-07 18 36.11
1304	05.10	20 14 16.560	22 25 28.200	-07 18 39.90
1304	05.10	21 07 39.878	23 18 57.617	-07 18 53.02
1304	05.10	21 25 15.666	23 36 35.353	-07 18 57.00
1304	11.10	19 41 19.913	22 16 02.116	-07 19 38.15
1304	11.10	19 57 57.781	22 32 42.418	-07 19 36.79
1304	11.10	20 47 04.487	23 21 56.497	-07 19 11.46
1304	11.10	21 05 38.369	23 40 32.754	-07 19 15.63
1304	11.10	21 54 31.160	00 29 33.495	-07 19 10.86
1304	11.10	22 55 54.847	01 31 06.901	-07 18 47.38
XXXXXX L = 19.2				
1311	10.02	22 38 48.592	09 12 05.665	-07 18 53.92
XXXXXX L = 18.7				
1331	14.07	20 57 01.217	17 38 53.930	-07 20 23.22
1331	14.07	21 12 19.542	17 54 27.837	-07 19 59.60
1331	14.07	22 34 08.667	19 17 39.965	-07 17 45.46
1331	14.07	22 49 29.953	19 33 16.032	-07 17 21.23
1331	14.07	23 35 31.224	20 19 59.587	-07 16 11.63
1331	14.07	23 50 58.663	20 35 40.188	-07 15 50.48
XXXXXX L = 19.0				
1341	10.02	21 18 29.295	07 51 06.597	-08 03 18.15
1341	10.02	21 33 54.937	08 06 36.303	-08 14 47.17
1341	10.02	22 38 48.592	09 11 43.570	-09 00 25.73
XXXXXX (d) L = 18.0-15.0				
1351	23.06	20 57 52.841	16 13 56.443	-07 19 26.10
1351	23.06	22 26 37.382	17 42 52.846	-07 26 46.66
1351	23.06	23 35 18.651	18 51 54.889	-07 31 31.38
1351	24.06	22 05 54.773	17 25 19.701	-07 25 23.85
1351	14.07	21 12 19.542	17 37 32.820	-07 25 40.86

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC	RA 2000	D 2000
		h m s	h m s	° ′ ″
1351	14.07	22 49 29.953	19 15 16.031	-07 33 49.33
1351	14.07	23 50 58.663	20 17 14.344	-07 37 26.34
		XXXXXX L = 17.0		
1361	18.02	22 31 11.390	09 26 19.931	-06 54 24.16
1361	18.02	23 45 04.806	10 40 40.861	-06 55 42.80
1361	19.02	00 50 56.913	11 46 57.473	-06 58 50.27
		91083A Eutelsat 2 F-3 (c) L = 16.0		
1371	18.02	22 31 11.390	09 21 53.607	-07 17 59.74
1371	18.02	23 45 04.806	10 35 56.880	-07 17 54.05
1371	19.02	00 50 56.913	11 41 57.382	-07 17 45.00
1372	17.03	19 08 52.889	07 49 31.390	-07 18 45.64
1372	17.03	21 07 38.571	09 48 34.559	-07 18 31.25
1372	17.03	21 54 48.545	10 35 50.974	-07 18 19.52
1373	13.05	21 30 30.308	13 56 12.764	-07 18 18.21
1373	13.05	23 01 46.208	15 27 40.676	-07 18 28.06
1373	15.05	20 32 47.422	13 06 21.805	-07 20 06.93
1373	15.05	22 25 28.829	14 59 18.934	-07 19 58.15
1374	23.06	20 57 52.841	16 05 05.626	-07 18 06.75
1374	23.06	22 26 37.382	17 34 00.621	-07 18 11.75
1374	23.06	23 35 18.651	18 42 49.758	-07 18 09.87
1374	24.06	22 05 54.773	17 17 13.152	-07 18 11.65
1375	14.07	21 12 19.542	17 42 22.512	-07 17 05.88
1375	14.07	22 49 29.953	19 19 44.482	-07 16 34.12
1375	14.07	23 50 58.663	20 21 20.488	-07 16 17.28
1375	15.07	20 56 01.328	17 29 57.359	-07 17 02.95
1376	05.10	19 57 48.525	21 54 59.090	-07 15 58.34
1376	05.10	20 14 16.560	22 11 29.402	-07 15 59.99
1376	05.10	21 25 15.666	23 22 37.568	-07 16 17.28
1376	11.10	19 41 19.913	22 02 02.584	-07 16 10.69
1376	11.10	20 47 04.487	23 07 55.994	-07 16 30.58
1376	11.10	21 54 31.160	00 15 31.358	-07 16 53.11
		XXXXXX(c) L = 16.3		
1381	05.10	19 57 48.525	21 56 19.436	-07 12 50.86
1381	05.10	20 14 16.560	22 12 50.307	-07 13 01.81
1381	05.10	21 25 15.666	23 24 01.521	-07 14 14.38
1381	11.10	19 41 19.913	22 03 29.916	-07 13 07.22
1381	11.10	20 47 04.487	23 09 26.062	-07 14 15.76
1381	11.10	21 54 31.160	00 17 04.579	-07 15 40.22
		XXXXXX L = 15.8		
1391	15.05	22 25 28.829	14 58 16.173	-06 18 54.04
		XXXXXX L = 01.4		
1401	18.01	20 10 26.107	03 54 16.382	-07 09 03.81
		XXXXXX L = 1.2		
1411	17.03	21 22 54.020	08 58 48.852	-07 09 29.94
1411	17.03	22 27 23.696	10 03 35.634	-07 08 42.82
1411	18.03	21 34 15.787	09 14 30.221	-07 09 26.12
		91015B MeteorSat 5 (MOP 2) (c) L = 359.7		
1421	05.10	21 41 06.811	22 27 08.391	-07 58 19.22
1421	05.10	23 16 27.066	00 02 41.130	-07 57 11.56
1421	11.10	20 13 39.308	21 23 26.079	-07 54 48.73
1421	11.10	21 22 00.523	22 31 56.795	-07 58 43.72
1421	11.10	22 12 12.462	23 22 15.545	-07 58 56.62
1421	11.10	23 11 58.068	00 22 09.104	-07 56 17.84
1421	11.10	23 27 15.084	00 37 28.180	-07 55 07.78
		89062A TV-Sat 2 (c) L = 359.4		
1431	10.02	21 49 05.384	06 55 33.186	-07 10 31.36
1431	10.02	22 55 48.785	08 02 24.708	-07 09 32.90
1431	18.02	22 50 12.428	08 28 24.005	-07 09 51.68

TABLE 2 (continued)

Orbit, arc number	Date 1996	UTC	RA 2000	D 2000
		h m s	h m s	* * *
1431	19.02	00 02 24.348	09 40 45.079	-07 09 01.64
1431	19.02	01 07 34.493	10 46 03.551	-07 08 29.14 *
1432	17.03	21 22 54.020	08 51 18.763	-07 14 07.87
1432	17.03	22 27 23.696	09 55 57.298	-07 14 02.86
1432	18.03	21 34 15.787	09 06 39.178	-07 14 09.97 *
1433	13.05	22 23 51.781	13 37 06.618	-07 16 42.36
1433	13.05	23 56 30.234	15 09 56.911	-07 15 20.02 *
1433	15.05	22 40 29.055	14 01 35.387	-07 17 53.35
1433	15.05	23 16 37.733	14 37 48.484	-07 17 15.11
1433	15.05	23 48 14.531	15 09 29.095	-07 16 33.34 *
1434	23.06	21 14 23.434	15 09 05.367	-07 13 10.17
1434	23.06	22 43 03.791	16 37 56.253	-07 13 09.46
1434	14.07	21 28 15.948	16 45 47.444	-07 12 13.95
1434	14.07	23 05 05.127	18 22 48.519	-07 13 31.35
1434	15.07	00 05 22.431	19 23 12.821	-07 14 10.88 *
1436	05.10	21 41 06.811	22 25 57.271	-07 06 31.88
1436	05.10	23 16 27.066	00 01 28.444	-07 06 38.81
1436	11.10	20 13 39.308	21 21 58.054	-07 07 07.32
1436	11.10	21 22 00.523	22 30 28.130	-07 06 45.51
1436	11.10	22 12 12.462	23 20 46.282	-07 06 45.93
1436	11.10	23 11 58.068	00 20 38.976	-07 07 05.42
1436	11.10	23 27 15.084	00 35 57.786	-07 07 12.66
		XXXXXX L = 359.3		
1441	10.02	22 55 48.785	08 01 36.076	-07 11 08.04
		94034A Intelsat 7 F-2 (c) L = 359.0		
1451	10.02	21 49 05.384	06 53 43.759	-07 12 56.62
1451	10.02	22 55 48.785	08 00 36.515	-07 13 52.87
1451	18.02	22 50 12.428	08 26 36.211	-07 13 38.90
1451	19.02	00 02 24.348	09 38 58.852	-07 13 57.56
1451	19.02	01 07 34.493	10 44 18.779	-07 14 01.12 *
1452	17.03	21 22 54.020	08 49 26.186	-07 14 15.84
1452	17.03	22 27 23.696	09 54 06.058	-07 14 18.75
1452	18.03	21 34 15.787	09 04 45.115	-07 14 19.98 *
1453	13.05	22 23 51.781	13 35 20.554	-07 15 14.67
1453	13.05	23 56 30.234	15 08 15.511	-07 14 20.42
1453	15.05	22 40 29.055	13 59 54.325	-07 15 02.45
1453	15.05	23 16 37.733	14 36 09.259	-07 14 46.53
1453	15.05	23 48 14.531	15 07 51.419	-07 14 26.15 *
1454	23.06	21 14 23.434	15 07 21.824	-07 13 37.56
1454	23.06	22 43 03.791	16 36 16.355	-07 13 19.92 *
1455	14.07	21 28 15.948	16 43 56.854	-07 13 34.80
1455	14.07	23 05 05.127	18 21 02.513	-07 12 22.96
1455	15.07	00 05 22.431	19 21 29.524	-07 11 33.22 *
1456	05.10	21 41 06.811	22 24 54.483	-07 08 24.71
1456	05.10	23 16 27.066	00 02 27.851	-07 08 58.40
1456	11.10	20 13 39.308	21 20 54.168	-07 08 28.01
1456	11.10	21 22 00.523	22 29 25.505	-07 08 38.14
1456	11.10	22 12 12.462	23 19 44.588	-07 08 55.21
1456	11.10	23 11 58.068	00 19 38.584	-07 09 27.08
1456	11.10	23 27 15.084	00 34 57.685	-07 09 34.87
		90074A Marco Polo 02 (Thor) (c) L = 359.2		
1461	18.02	22 50 12.428	08 27 21.523	-07 14 16.16
1461	19.02	00 02 24.348	09 39 43.937	-07 14 49.85
1461	19.02	01 07 34.493	10 45 03.851	-07 15 03.35 *
1462	17.03	21 22 54.020	08 50 10.505	-07 12 58.40
1462	17.03	22 27 23.696	09 54 49.875	-07 12 50.29
1462	18.03	21 34 15.787	09 05 29.540	-07 13 00.70 *
1463	05.10	21 41 06.811	22 24 11.711	-07 08 20.24

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC	RA 2000	D 2000
		h m s	h m s	° ′ ″
1463	05.10	23 16 27.066	23 59 47.914	-07 08 30.91
1463	11.10	20 13 39.308	21 20 05.604	-07 08 40.37
1463	11.10	21 22 00.523	22 28 39.383	-07 08 33.25
1463	11.10	22 12 12.462	23 19 00.087	-07 08 38.32
1463	11.10	23 11 58.068	00 18 55.721	-07 08 55.45
1463	11.10	23 27 15.084	00 34 15.134	-07 08 59.59
		XXXXXX L = 359.1		
1471	19.02	00 02 24.348	09 38 57.689	-06 48 19.07
		90079A Skynet 4C (c) L = 359.0		
1481	11.10	23 11 58.068	00 18 57.802	-07 11 28.54
1481	11.10	23 27 15.084	00 34 16.723	-07 06 50.99
		XXXXXX L = 359.1		
1491	05.10	23 16 27.066	23 59 44.043	-07 16 52.21
		94087D Raduga 32 f.s. (d2) L = 357.4		
1501	05.10	21 41 06.811	22 17 09.920	-07 02 21.82
1501	05.10	23 16 27.066	23 52 37.441	-06 57 15.00
1501	11.10	21 38 41.797	22 21 49.827	-07 00 21.00
1501	11.10	22 29 06.086	23 12 18.099	-06 57 28.36
1501	11.10	23 42 04.111	00 25 20.854	-06 54 25.99
		XXXXXX(c) L = 356.0		
1511	05.10	21 57 31.424	22 27 33.062	-07 10 58.82
1511	05.10	23 31 56.569	00 02 10.076	-07 11 35.18
1511	11.10	21 38 41.797	22 32 27.021	-07 11 15.75
1511	11.10	22 29 06.086	23 22 57.982	-07 11 39.00
1511	11.10	23 42 04.111	00 36 05.295	-07 12 03.87
		XXXXXX(c) L = 356.0		
1521	23.06	21 14 23.434	14 54 21.327	-07 11 44.91
1521	23.06	21 32 00.616	15 12 00.650	-07 11 42.58
1521	23.06	22 43 03.791	16 23 12.267	-07 11 23.40
1521	23.06	22 59 48.487	16 39 59.028	-07 11 18.94
1521	14.07	21 28 15.948	16 30 54.744	-07 10 16.18
1521	14.07	21 44 08.804	16 46 49.742	-07 10 24.33
1521	14.07	23 05 05.127	18 07 57.066	-07 11 09.66
1521	14.07	23 18 58.734	18 21 52.528	-07 11 18.54
1521	15.07	00 05 22.431	19 08 22.473	-07 11 41.06
1521	15.07	00 19 56.262	19 22 58.151	-07 11 47.33
1523	05.10	21 41 06.811	22 11 06.174	-07 10 51.63
1523	05.10	23 16 27.066	23 46 38.789	-07 11 31.26
1523	11.10	21 22 00.523	22 15 43.378	-07 11 06.33
1523	11.10	22 12 12.462	23 06 02.085	-07 11 30.15
1523	11.10	23 11 58.068	00 05 55.561	-07 11 54.81
1523	11.10	23 27 15.084	00 21 14.433	-07 11 59.74
		92021A Telecom 2B(c) L = 355.0		
1531	18.01	20 31 24.813	03 47 54.643	-07 07 42.58
1532	10.02	22 06 27.069	06 53 53.440	-07 08 52.21
1532	10.02	23 12 35.709	08 00 08.850	-07 09 00.00
1532	18.02	23 07 40.611	08 26 38.028	-07 08 28.63
1532	19.02	00 19 21.897	09 38 27.142	-07 08 17.16
1532	19.02	01 24 11.742	10 43 24.249	-07 08 15.81
1533	17.03	21 38 21.934	08 47 35.799	-07 09 47.24
1533	17.03	22 42 47.914	09 52 09.533	-07 09 39.43
1533	18.03	22 04 13.592	09 17 26.670	-07 11 17.43
1534	13.05	22 43 58.272	13 38 08.162	-07 13 07.69
1534	14.05	00 13 59.064	15 08 19.418	-07 12 41.93
1534	15.05	22 55 50.442	13 57 55.061	-07 13 01.71
1534	15.05	23 32 24.249	14 34 33.032	-07 12 55.85
1534	16.05	00 03 31.692	15 05 43.983	-07 12 46.16
1535	23.06	22 59 48.487	16 35 33.874	-07 11 53.89

TABLE 2 (continued)

Orbit. arc number	Date 1996	UTC h m s	RA 2000	D 2000
			h m s	*
1536	14.07	21 44 08.804	16 42 35.707	-07 11 55.02
1536	14.07	23 18 58.734	18 17 36.910	-07 11 49.42
1536	15.07	00 19 56.262	19 18 41.402	-07 11 33.55 *
1537	05.10	21 57 31.424	22 23 14.774	-07 07 38.28
1537	05.10	23 31 56.569	23 57 51.283	-07 07 24.83
1537	11.10	20 30 38.697	21 19 53.540	-07 08 11.06
1537	11.10	21 38 41.797	22 28 06.150	-07 07 52.35
1537	11.10	22 29 06.086	23 18 36.906	-07 07 46.12
1537	11.10	23 42 04.111	00 31 43.839	-07 07 42.78
91084A Telecom 2A(c) L = 352.0				
1541	10.02	22 06 27.069	06 40 48.154	-07 07 22.83
1541	10.02	23 12 35.709	07 47 03.580	-07 07 15.32 *
1541	18.02	23 07 40.611	08 13 42.550	-07 07 54.40
1541	19.02	00 19 21.897	09 25 31.852	-07 07 49.52
1541	19.02	01 24 11.742	10 30 29.305	-07 07 46.38
1541	19.02	01 40 23.761	10 46 43.192	-07 07 46.89
1541	19.02	02 27 28.732	11 33 53.932	-07 07 45.35 *
1541	19.02	02 43 24.449	11 50 03.502	-07 09 45.72 *
1542	17.03	20 01 39.448	06 57 37.708	-06 57 23.46 *
1542	17.03	21 38 21.934	08 34 36.097	-07 09 21.02
1542	17.03	22 10 19.535	09 06 37.580	-07 09 19.99
1542	17.03	22 42 47.914	09 39 09.955	-07 09 16.36
1542	17.03	22 57 17.001	09 53 40.693	-07 09 14.34
1542	18.03	22 04 13.592	09 04 26.461	-07 09 21.74 *
1543	13.05	22 43 58.272	13 25 02.924	-07 10 32.60
1543	14.05	00 13 59.064	14 55 14.934	-07 10 12.65
1543	15.05	22 55 50.442	13 44 47.570	-07 10 28.43
1543	15.05	23 32 24.249	14 21 26.143	-07 10 22.12
1543	16.05	00 03 31.692	14 52 37.579	-07 10 16.10 *
1544	23.06	21 32 00.616	14 54 45.746	-07 10 07.72
1544	23.06	22 59 48.487	16 22 44.298	-07 10 04.30 *
1545	05.10	21 57 31.424	22 10 24.275	-07 06 45.08
1545	05.10	23 31 56.569	23 44 59.905	-07 06 52.13
1545	11.10	20 30 38.697	21 06 59.091	-07 05 26.23
1545	11.10	21 38 41.797	22 15 11.198	-07 05 11.99
1545	11.10	22 29 06.086	23 05 41.432	-07 05 12.05
1545	11.10	23 42 04.111	00 18 47.458	-07 05 25.08
XXXXXX L = 354.2				
1551	14.07	23 18 58.734	18 13 53.041	-07 30 54.16
XXXXXX L = 352.1				
1561	14.07	21 44 08.804	16 29 39.100	-07 09 27.06
1561	14.07	23 18 58.734	18 04 41.149	-07 09 45.84
92043A Gorizont 26 (c) L = 348.5				
1571	19.02	01 40 23.761	10 31 55.867	-05 39 01.03
1571	19.02	02 27 28.732	11 19 08.900	-05 41 23.41
1571	19.02	02 43 24.449	11 35 06.777	-05 42 58.71
XXXXXX L = 347.9				
1581	19.02	01 40 23.761	10 29 26.865	-07 07 57.80
1581	19.02	02 27 28.732	11 16 39.132	-07 07 32.78
1581	19.02	02 43 24.449	11 32 37.242	-07 07 23.57
1581	17.03	22 57 17.001	09 36 26.583	-07 06 28.12
94060A Cosmos 2291 (c) L = 346.4				
1591	19.02	01 40 23.761	10 23 02.773	-07 23 19.80
1591	19.02	02 27 28.732	11 10 14.874	-07 26 41.75

TABLE 3. RESULTS OF GEOSYNCHRONOUS SATELLITES OBSERVATIONS IN UZHGOROD IN 1996

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950 h m s	D 1950 ° ′ ″
95054D Proton-K f.s. (d) L = 0.38				
0011	04.10	21 24 03.19	22 09 04.25	-5 05 19.5
0011	04.10	21 26 02.98	22 11 03.33	-5 04 22.8
84023A Intelsat 5 F-8 (d) L = 1.28				
0021	19.05	22 39 02.74	14 24 07.72	-4 47 21.3
0021	19.05	22 41 02.81	14 26 04.04	-4 49 17.2
0021	19.05	23 59 02.70	15 41 12.37	-6 19 15.4
0021	20.05	00 01 02.76	15 43 08.41	-6 21 26.7
88018B Telecom 1C (c - d) L = 2.98				
0031	15.01	23 30 02.72	07 10 09.60	-6 45 44.0
0031	15.01	23 32 02.78	07 12 09.01	-6 45 29.2
0031	16.01	00 51 04.15	08 31 19.22	-6 32 18.1
0031	16.01	00 53 02.71	08 33 18.20	-6 32 00.4
0031	16.01	22 58 04.14	06 42 02.22	-6 51 01.0
0031	16.01	23 00 02.65	06 44 01.08	-6 50 36.7
95067A Telecom 2C (c) L = 3.02				
0041	18.03	22 19 02.68	10 07 28.37	-6 53 06.7
0041	18.03	22 21 02.64	10 09 27.93	-6 53 01.7
0041	19.03	01 06 02.57	12 54 41.38	-6 50 14.4
0041	19.03	01 08 02.56	12 56 41.75	-6 50 15.2
0041	19.03	22 50 02.65	10 42 24.72	-6 51 46.7
0041	19.03	22 52 02.69	10 44 25.16	-6 51 43.0
0042	19.05	22 34 02.76	14 26 36.22	-6 55 28.8
0042	19.05	22 36 02.76	14 28 36.51	-6 55 29.7
0042	19.05	23 54 02.66	15 46 42.21	-6 59 08.8
0042	19.05	23 56 02.68	15 48 42.52	-6 59 13.7
0043	08.09	21 54 02.86	21 08 05.64	-7 17 59.7
0043	08.09	21 56 02.81	21 10 06.10	-7 18 04.1
0044	04.10	21 24 03.19	22 20 30.99	-7 19 04.1
0044	04.10	21 26 02.98	22 22 31.42	-7 19 11.7
0044	07.10	21 25 02.80	22 33 20.99	-7 19 48.4
0044	07.10	21 27 02.76	22 35 21.57	-7 19 49.9
92043D Gorizont 26 f.s. (d) L = 3.64				
0051	16.01	22 58 04.14	06 44 53.15	-6 04 48.5
0051	16.01	23 00 02.65	06 46 49.05	-6 04 03.4
90054D Gorizont 20 f.s. (d) L = 4.43				
0061	15.01	23 30 02.72	07 16 29.45	-4 41 01.2
0061	15.01	23 32 02.78	07 18 29.94	-4 39 35.4
0061	16.01	00 51 04.15	08 37 51.17	-3 54 07.3
0061	16.01	00 53 02.71	08 39 50.36	-3 53 16.7
0061	16.01	22 58 04.14	06 51 53.89	-4 59 18.8
0061	16.01	23 00 02.65	06 53 52.80	-4 57 45.1
91064B Kosmos 2155 f.s. (d) L = 4.61				
0071	15.01	23 30 02.72	07 17 19.72	-5 25 20.6
0071	15.01	23 32 02.78	07 19 19.86	-5 24 16.9
0071	16.01	00 51 04.15	08 38 16.69	-4 48 28.2
0071	16.01	00 53 02.71	08 40 14.92	-4 47 44.4
0071	16.01	22 58 04.14	06 43 29.27	-5 44 04.1
0071	16.01	23 00 02.65	06 45 28.00	-5 42 49.8
89027A Tele-X (c) L = 5.01				
0081	15.01	23 30 02.72	07 19 06.31	-6 58 46.1
0081	15.01	23 32 02.78	07 21 06.69	-6 58 37.3
0081	16.01	00 51 04.15	08 40 15.11	-6 53 07.3
0081	16.01	00 53 02.71	08 42 13.91	-6 53 01.3
0081	16.01	22 58 04.14	06 51 00.51	-7 00 51.9
0081	16.01	23 00 02.65	06 52 58.97	-7 00 39.3

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	*
0082	18.03	22 19 02.68	10 16 06.51	-6 54 28.5 *
0082	18.03	22 21 02.64	10 18 06.21	-6 54 23.4
0082	19.03	01 06 02.57	13 03 21.54	-6 51 46.3
0082	19.03	01 08 02.56	13 05 21.85	-6 51 46.9
0082	19.03	22 50 02.65	10 51 04.64	-6 53 13.4
0082	19.03	22 52 02.69	10 53 04.82	-6 53 10.7 *
0083	19.05	22 34 02.76	14 35 33.92	-6 59 14.6
0083	19.05	22 36 02.76	14 37 34.24	-6 59 17.2
0083	19.05	23 54 02.66	15 55 41.92	-7 01 51.0
0083	19.05	23 56 02.68	15 57 42.02	-7 01 57.1
89067A Marco Polo I (c) L = 5.17				
0091	18.03	22 19 02.68	10 16 58.06	-6 53 15.2
0091	18.03	22 21 02.64	10 18 57.73	-6 53 09.8
0091	19.03	01 06 02.57	13 04 16.77	-6 51 17.1
0091	19.03	01 08 02.56	13 06 17.04	-6 51 18.4
0091	19.03	22 50 02.65	10 51 55.91	-6 52 06.3
0091	19.03	22 52 02.69	10 53 56.34	-6 52 04.4
0092	04.10	21 17 02.94	22 23 14.25	-7 19 56.1
0092	04.10	21 19 02.90	22 25 14.67	-7 20 00.6
84101A Galaxy 3 (d) L = 5.37				
0101	18.03	22 19 02.68	10 17 51.02	-5 50 11.8
0101	18.03	22 21 02.64	10 19 50.31	-5 50 01.2
0101	19.03	01 06 02.57	13 04 39.21	-5 54 08.4
0101	19.03	01 08 02.56	13 06 39.30	-5 54 24.8
0101	19.03	22 50 02.65	10 45 56.78	-5 47 30.3
0101	19.03	22 52 02.69	10 47 56.36	-5 47 25.7
93076A NATO 4B (c) L = 6.01				
0111	15.01	23 30 02.72	07 23 31.44	-5 47 40.6
0111	15.01	23 32 02.78	07 25 31.50	-5 49 18.8
0111	16.01	00 51 04.15	08 44 39.18	-6 52 04.8
0111	16.01	00 53 02.71	08 46 37.42	-6 53 53.9
0111	16.01	22 58 04.14	06 55 26.50	-5 27 05.3
0111	16.01	23 00 02.65	06 57 25.45	-5 28 24.1 *
0112	18.03	22 19 02.68	10 20 21.67	-8 06 36.7
0112	18.03	22 21 02.64	10 22 20.89	-8 08 06.3
0112	19.03	22 50 02.65	10 55 21.00	-8 31 50.4
0112	19.03	22 52 02.69	10 57 21.68	-8 33 19.2 *
0113	04.10	21 17 02.94	22 26 43.80	-6 16 54.0
0113	04.10	21 19 02.90	22 28 43.95	-6 15 39.2 *
0113	07.10	21 16 02.86	22 37 28.73	-6 14 17.1
0113	07.10	21 18 02.94	22 39 29.22	-6 12 53.6
92041B Estelsat 2 F-4 (c) L = 6.98				
0121	15.01	23 30 02.72	07 27 48.78	-7 02 06.2
0121	15.01	23 32 02.78	07 29 48.29	-7 02 01.0
0121	16.01	00 51 04.15	08 48 58.40	-6 57 21.7
0121	16.01	00 53 02.71	08 50 56.02	-6 57 14.3
0121	16.01	22 58 04.14	06 59 43.67	-7 03 47.2
0121	16.01	23 00 02.65	07 01 42.18	-7 03 36.0 *
0122	18.03	22 13 02.62	10 19 04.22	-6 54 31.6
0122	18.03	22 15 03.57	10 21 03.94	-6 54 27.5
0122	19.03	01 00 02.59	13 06 19.69	-6 51 54.2
0122	19.03	01 02 02.63	13 08 19.95	-6 51 55.2
0122	19.03	22 44 02.70	10 54 01.01	-6 53 19.8
0122	19.03	22 46 02.66	10 56 01.23	-6 53 13.0 *
0123	19.05	22 34 02.76	14 44 19.04	-6 56 33.1
0123	19.05	22 36 02.76	14 46 19.46	-6 56 38.8
0123	19.05	23 54 02.66	16 04 27.14	-7 00 46.6
0123	19.05	23 56 02.68	16 06 27.69	-7 00 55.1 *
0124	08.09	21 49 03.01	21 20 45.47	-7 18 47.9

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC (SU)	RA 1950	D 1950
		h m s	h m s	° ′ ″
0124	08.09	21 51 02.67	21 22 45.52	-7 18 54.3
0124	08.09	21 54 02.86	21 25 45.99	-7 19 02.3
0124	08.09	21 56 02.81	21 27 46.46	-7 19 08.0
0125	04.10	21 17 02.94	22 31 14.94	-7 22 00.6
0125	04.10	21 19 02.90	22 33 15.56	-7 22 03.9
		80091A SBS 1 (d) L = 8.45		
0131	19.05	22 29 02.77	14 46 31.62	-4 41 08.9
0131	19.05	22 31 02.69	14 48 30.88	-4 45 39.0
0131	19.05	23 49 02.67	16 06 00.42	-7 33 06.4
0131	19.05	23 51 03.14	16 08 00.28	-7 36 55.0
		91046D Gorizont 23 f.s. (d) L = 9.78		
0141	19.05	22 29 02.77	14 51 23.91	-5 54 09.8
0141	19.05	22 31 02.69	14 53 24.46	-5 55 20.4
0141	19.05	23 49 02.67	16 11 29.25	-6 53 56.6
0141	19.05	23 51 03.14	16 13 27.25	-6 55 54.9
		91003B Eutelsat 2 F-2 (c) L = 10.04		
0151	15.01	23 25 02.73	07 36 21.37	-7 02 26.2
0151	15.01	23 27 02.71	07 38 21.85	-7 02 21.0
0151	16.01	00 46 02.61	08 57 29.78	-6 58 15.2
0151	16.01	00 48 02.58	08 59 30.02	-6 58 09.4
0151	16.01	22 53 04.70	07 08 15.40	-7 04 00.7
0151	16.01	22 55 02.69	07 10 13.81	-7 03 52.3
0152	18.03	22 13 02.62	10 32 16.64	-6 54 06.8
0152	19.03	01 00 02.59	13 19 32.39	-6 52 19.3
0152	19.03	01 02 02.63	13 21 32.60	-6 52 21.0
0152	19.03	22 44 02.70	11 07 17.29	-6 53 32.3
0152	19.03	22 46 02.66	11 09 17.21	-6 53 30.0
0153	19.05	22 29 02.77	14 52 35.90	-6 57 45.9
0153	19.05	22 31 02.69	14 54 36.14	-6 57 52.5
0153	19.05	23 49 02.67	16 12 26.63	-7 04 39.4
0153	19.05	23 51 03.14	16 14 23.87	-7 05 19.2
0154	08.09	21 49 03.01	21 34 07.08	-7 19 51.0
0154	08.09	21 51 02.67	21 36 07.19	-7 19 55.8
0155	04.10	21 12 02.80	22 39 36.53	-7 22 35.6
0155	04.10	21 14 03.10	22 41 37.10	-7 22 41.8
0155	07.10	21 10 02.82	22 49 22.38	-7 23 07.6
0155	07.10	21 12 02.86	22 51 23.02	-7 23 11.0
		92088A Kosmos 2224 (c) L = 11.77		
0161	15.01	23 20 02.62	07 39 01.16	-6 24 44.2
0161	15.01	23 22 02.72	07 41 01.91	-6 24 44.2
0161	16.01	00 36 02.54	08 55 10.69	-6 27 15.7
0161	16.01	00 38 06.63	08 57 15.40	-6 27 23.8
0161	16.01	22 48 02.67	07 10 59.24	-6 24 56.3
0161	16.01	22 50 02.70	07 12 59.80	-6 24 53.4
0162	18.03	22 13 02.62	10 38 10.32	-6 31 24.3
0162	18.03	22 15 03.57	10 40 11.89	-6 31 37.3
0162	19.03	01 00 02.59	13 25 30.18	-6 58 35.1
0162	19.03	01 02 02.63	13 27 30.44	-6 58 54.6
0162	19.03	22 44 02.70	11 13 07.55	-6 35 53.4
0162	19.03	22 46 02.66	11 15 07.88	-6 36 09.4
0163	19.05	22 15 02.82	14 48 10.01	-7 12 44.4
0163	19.05	22 17 03.02	14 50 10.67	-7 13 13.1
0163	19.05	23 44 02.69	16 17 19.56	-7 32 04.8
0163	19.05	23 46 02.77	16 19 19.98	-7 32 28.4
0164	04.10	21 12 02.80	22 46 37.18	-8 08 04.3
0164	04.10	21 14 03.10	22 48 38.04	-8 07 50.1
0164	07.10	21 10 02.82	22 56 19.52	-8 07 16.5
0164	07.10	21 12 02.86	22 58 20.15	-8 07 00.7

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU)	RA 1950	D 1950
		<i>h m s</i>	<i>h m s</i>	<i>° ′ ″</i>
<b>92074D Ekran 20 f.s. (d) <math>L = 11.61</math></b>				
0171	18.03	22 07 02.61	10 33 22.90	-5 42 41.2
0171	18.03	22 09 02.57	10 35 24.28	-5 42 40.4
0171	19.03	00 55 02.61	13 23 13.41	-6 02 35.3
0171	19.03	00 57 02.50	13 25 14.82	-6 03 00.6
0171	19.03	23 58 02.88	12 43 21.96	-5 54 04.0
0171	20.03	00 00 03.00	12 45 24.03	-5 54 27.2
<b>XXXXX <math>L = 11.44</math></b>				
0181	19.05	22 29 02.77	14 59 03.70	-5 45 34.9
0181	19.05	22 31 02.69	15 01 04.18	-5 48 40.3
0181	19.05	23 49 02.67	16 18 52.07	-7 40 33.8
0181	19.05	23 51 03.14	16 20 52.86	-7 43 23.0
<b>90079B Eutelsat 2 F-1 (c) <math>L = 12.97</math></b>				
0191	15.01	23 20 02.62	07 44 19.57	-6 58 39.7
0191	15.01	23 22 02.72	07 46 19.60	-6 58 29.2
0191	16.01	00 36 02.54	09 00 26.63	-6 54 37.6
0191	16.01	00 38 06.63	09 02 30.91	-6 54 30.8
0191	16.01	22 48 02.67	07 16 12.45	-7 00 23.1
0191	16.01	22 50 02.70	07 18 12.59	-7 00 12.6
0192	18.03	22 07 02.61	10 39 37.21	-6 53 09.5
0192	18.03	22 09 02.57	10 41 37.79	-6 53 06.1
0192	19.03	00 55 02.61	13 27 55.50	-6 53 18.0
0192	19.03	00 57 02.50	13 29 55.51	-6 53 19.6
0192	19.03	23 58 02.88	12 34 49.34	-6 52 21.1
0192	20.03	00 00 03.00	12 36 49.37	-6 52 22.1
0193	19.05	22 15 02.82	14 51 48.17	-6 58 30.6
0193	19.05	22 17 03.02	14 53 48.66	-6 58 38.6
0193	19.05	23 44 02.69	16 20 58.80	-7 04 10.6
0193	19.05	23 46 02.77	16 22 58.92	-7 04 18.4
0194	04.10	21 07 02.82	22 47 48.15	-7 21 58.1
0194	04.10	21 09 02.89	22 49 48.78	-7 22 01.0
0194	07.10	21 04 02.98	22 56 35.88	-7 22 24.6
0194	07.10	21 06 02.78	22 58 36.19	-7 22 26.5
<b>95016B Hot Bird 1 (c) <math>L = 12.99-13.02</math></b>				
0201	15.01	23 20 02.62	07 44 26.16	-7 00 30.8
0201	15.01	23 22 02.72	07 46 26.24	-7 00 21.1
0201	16.01	00 36 02.54	09 00 33.98	-6 57 13.7
0201	16.01	00 38 06.63	09 02 38.29	-6 57 08.1
0201	16.01	22 48 02.67	07 16 18.74	-7 01 53.3
0201	16.01	22 50 02.70	07 18 18.93	-7 01 45.1
0202	18.03	22 07 02.61	10 39 46.40	-6 56 09.2
0202	18.03	22 09 02.57	10 41 46.90	-6 56 06.7
0202	19.03	00 55 02.61	13 27 58.89	-6 55 54.4
0202	19.03	00 57 02.50	13 29 58.95	-6 55 55.4
0202	19.03	23 58 02.88	12 34 52.44	-6 55 15.6
0202	20.03	00 00 03.00	12 36 52.53	-6 55 13.8
0203	19.05	22 15 02.82	14 51 50.06	-7 00 28.6
0203	19.05	22 17 03.02	14 53 50.43	-7 00 34.2
0203	19.05	23 44 02.69	16 20 56.92	-7 05 04.9
0203	19.05	23 46 02.77	16 22 57.07	-7 05 10.8
0204	08.09	21 44 02.94	21 42 16.84	-7 20 15.3
0204	08.09	21 46 03.06	21 44 17.40	-7 20 19.4
2181	04.10	21 07 02.82	22 47 54.99	-7 24 59.5
2181	04.10	21 09 02.89	22 49 55.69	-7 25 02.4
2181	07.10	21 04 02.98	22 56 41.46	-7 25 26.5
2181	07.10	21 06 02.78	22 58 41.86	-7 25 28.7
<b>91003A Italsat 1 (c) <math>L = 13.24</math></b>				
0211	15.01	23 20 02.62	07 45 33.32	-6 56 49.9
0211	15.01	23 22 02.72	07 47 33.09	-6 56 40.9

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	* * *
0211	16.01	00 36 02.54	09 01 41.91	-6 52 41.0
0211	16.01	00 38 06.63	09 03 46.17	-6 52 34.0
0211	16.01	22 48 02.67	07 17 27.61	-6 58 40.0
0211	16.01	22 50 02.70	07 19 27.82	-6 58 29.0
0212	18.03	22 07 02.61	10 40 18.55	-6 52 03.7
0212	18.03	22 09 02.57	10 42 18.98	-6 52 00.2
0212	19.03	00 55 02.61	13 28 39.50	-6 53 06.0
0212	19.03	00 57 02.50	13 30 39.49	-6 53 08.4
0212	19.03	23 58 02.88	12 35 27.67	-6 51 49.1
0212	20.03	00 00 03.00	12 37 27.83	-6 51 49.0
0213	19.05	22 15 02.82	14 52 23.44	-6 56 26.1
0213	19.05	22 17 03.02	14 54 24.00	-6 56 33.2
0213	19.05	23 44 02.69	16 21 35.88	-7 02 49.3
0213	19.05	23 46 02.77	16 23 36.02	-7 02 58.8
0214	08.09	21 44 02.94	21 43 00.91	-7 23 13.5
0214	08.09	21 46 03.06	21 45 01.52	-7 23 18.3
0215	04.10	21 07 02.82	22 48 34.68	-7 23 30.9
0215	04.10	21 09 02.89	22 50 35.36	-7 23 32.0
0215	07.10	21 04 02.98	22 57 27.97	-7 23 57.3
0215	07.10	21 06 02.78	22 59 28.36	-7 23 58.4
38095A Raduga 22 (c) L=13.18				
0221	19.05	23 44 02.69	16 21 53.64	-7 10 57.2
0221	19.05	23 46 02.77	16 23 51.48	-7 12 34.9
91083A Eutelsat 2 F-3 (c) L=15.98				
0231	15.01	23 20 02.62	07 57 40.60	-7 00 33.2
0231	15.01	23 22 02.72	07 59 41.30	-7 00 27.1
0231	16.01	00 36 02.54	09 13 47.74	-6 56 53.6
0231	16.01	00 38 06.63	09 15 50.98	-6 56 46.3
0231	16.01	22 48 02.67	07 29 30.40	-7 01 56.8
0231	16.01	22 50 02.70	07 31 28.58	-7 01 47.7
0232	18.03	22 07 02.61	10 52 52.17	-6 54 03.2
0232	18.03	22 09 02.57	10 54 52.36	-6 54 04.4
0232	19.03	00 55 02.61	13 41 08.81	-6 54 00.0
0232	19.03	00 57 02.50	13 43 08.82	-6 54 04.1
0232	19.03	23 58 02.88	12 48 00.50	-6 54 11.0
0232	20.03	00 00 03.00	12 50 01.30	-6 54 14.2
0233	19.05	22 15 02.82	15 05 08.33	-7 00 12.8
0233	19.05	22 17 03.02	15 07 09.02	-7 00 18.4
0233	19.05	23 44 02.69	16 34 17.02	-7 05 22.1
0233	19.05	23 46 02.77	16 36 17.70	-7 05 29.5
0234	08.09	21 39 02.90	21 50 38.86	-7 21 13.9
0234	08.09	21 41 02.85	21 52 39.44	-7 21 18.1
0235	04.10	21 07 02.82	23 01 10.46	-7 23 59.7
0235	04.10	21 09 02.89	23 03 11.23	-7 24 02.6
0235	07.10	21 04 02.98	23 09 55.89	-7 24 34.0
0235	07.10	21 06 02.78	23 11 56.54	-7 24 36.6
94060D Kosmos 2291 f.s. (d) L=18.29				
0241	19.05	22 10 03.38	15 10 21.90	-7 18 47.8
0241	19.05	22 12 02.82	15 12 21.49	-7 18 53.3
0241	19.05	23 35 02.73	16 35 26.64	-7 21 16.7
0241	19.05	23 37 02.73	16 37 27.01	-7 21 18.0
93031A Astra 1C (c) L=19.16				
0251	15.01	23 15 02.60	08 06 47.50	-7 00 27.4
0251	15.01	23 17 02.76	08 08 48.16	-7 00 22.1
0251	16.01	00 31 02.57	09 22 55.02	-6 57 51.1
0251	16.01	00 33 02.56	09 24 55.13	-6 57 38.1
0251	16.01	22 42 02.67	07 37 40.11	-7 01 38.3
0251	16.01	22 44 02.72	07 39 40.63	-7 01 33.6
0252	18.03	23 33 04.11	12 33 06.67	-6 57 04.6

TABLE 3 (continued)

Orbit. arc number	Date	UTC(SU)	RA 1950	D 1950
		1996 <i>h m s</i>	<i>h m s</i>	* * *
0252	18.03	23 35 02.66	12 35 05.57	-6 57 07.4
0252	19.03	00 50 02.56	13 50 13.52	-6 58 45.2
0252	19.03	00 52 02.53	13 52 13.85	-6 58 47.2
0252	19.03	23 49 03.63	12 53 05.30	-6 57 26.0
0252	19.03	23 51 02.81	12 55 05.02	-6 57 27.9 *
0253	19.05	22 10 03.38	15 14 14.37	-7 02 20.3
0253	19.05	22 12 02.82	15 16 13.86	-7 02 28.8
0253	19.05	23 35 02.73	16 39 22.92	-7 07 57.6
0253	19.05	23 37 02.73	16 41 23.26	-7 08 04.2 *
0254	08.09	21 39 02.90	22 04 48.82	-7 24 23.4
0254	08.09	21 41 02.85	22 06 49.24	-7 24 28.6 *
0255	04.10	21 02 02.96	23 10 18.06	-7 26 54.0
0255	04.10	21 04 02.87	23 12 18.41	-7 26 56.2
0255	07.10	20 59 03.13	23 19 02.78	-7 27 16.4
0255	07.10	21 01 03.10	23 21 03.14	-7 27 17.9
95055A Astra 1E (c) L = 19.18				
0261	15.01	23 15 02.60	08 06 54.48	-6 58 27.5
0261	15.01	23 17 02.76	08 08 55.10	-6 58 22.9
0261	16.01	00 31 02.57	09 23 00.28	-6 56 13.4
0261	16.01	00 33 02.56	09 25 00.34	-6 56 02.3
0261	16.01	22 42 02.67	07 37 48.27	-6 59 34.6
0261	16.01	22 44 02.72	07 39 48.79	-6 59 29.9 *
0262	18.03	23 33 04.11	12 33 09.10	-6 57 11.7
0262	18.03	23 35 02.66	12 35 08.06	-6 57 13.3
0262	19.03	00 50 02.56	13 50 18.21	-6 58 13.6
0262	19.03	00 52 02.53	13 52 18.54	-6 58 14.7
0262	19.03	23 49 03.63	12 53 08.24	-6 57 24.2
0262	19.03	23 51 02.81	12 55 08.15	-6 57 24.4 *
0263	19.05	22 10 03.38	15 14 14.46	-7 04 17.0
0263	19.05	22 12 02.82	15 16 13.93	-7 04 23.7
0263	19.05	23 35 02.73	16 39 25.66	-7 08 30.7
0263	19.05	23 37 02.73	16 41 26.08	-7 08 35.0 *
0264	08.09	21 39 02.90	22 05 07.06	-7 19 25.1
0264	08.09	21 41 02.85	22 07 07.48	-7 19 27.7 *
0265	04.10	21 02 02.96	23 10 39.70	-7 22 57.0
0265	04.10	21 04 02.87	23 12 40.16	-7 22 58.1 *
0265	07.10	20 59 03.13	23 19 25.33	-7 23 21.6
0265	07.10	21 01 03.10	23 21 25.74	-7 23 24.2
94070A Astra 1D (c) L = 19.19				
0271	15.01	23 15 02.60	08 06 55.77	-7 00 06.2
0271	15.01	23 17 02.76	08 08 56.50	-7 00 00.5
0271	16.01	00 31 02.57	09 23 06.24	-6 56 44.4
0271	16.01	00 33 02.56	09 25 06.53	-6 56 33.0
0271	16.01	22 42 02.67	07 37 48.84	-7 01 36.0
0271	16.01	22 44 02.72	07 39 49.41	-7 01 29.9 *
0272	18.03	23 33 04.11	12 33 16.23	-6 55 03.0
0272	18.03	23 35 02.66	12 35 15.16	-6 55 05.9
0272	19.03	00 50 02.56	13 50 25.58	-6 55 56.0
0272	19.03	00 52 02.53	13 52 25.92	-6 55 37.8
0272	19.03	23 49 03.63	12 53 12.06	-6 55 08.9
0272	19.03	23 51 02.81	12 55 11.81	-6 55 08.5 *
0273	19.05	22 10 03.38	15 14 20.46	-6 59 11.7
0273	19.05	22 12 02.82	15 16 20.07	-6 59 19.0
0273	19.05	23 35 02.73	16 39 29.19	-7 04 47.0
0273	19.05	23 37 02.73	16 41 29.61	-7 04 55.5 *
0274	08.09	21 39 02.90	22 04 47.86	-7 25 17.8
0274	08.09	21 41 02.85	22 06 48.29	-7 25 19.9 *
0275	04.10	21 02 02.96	23 10 22.32	-7 24 20.0
0275	04.10	21 04 02.87	23 12 22.75	-7 24 20.4

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	°' " ."
0275	07.10	20 59 03.13	23 19 15.09	-7 24 45.3
0275	07.10	21 01 03.10	23 21 15.37	-7 24 48.5
		88109B Astra 1A (c) $L = 19.23$		
0281	15.01	23 15 02.60	08 07 05.76	-6 56 25.8
0281	15.01	23 17 02.76	08 09 06.59	-6 56 17.6
0281	16.01	00 31 02.57	09 23 16.22	-6 52 21.4
0281	16.01	00 33 02.56	09 25 16.27	-6 52 09.5
0281	16.01	22 42 02.67	07 38 00.39	-6 58 14.9
0281	16.01	22 44 02.72	07 40 00.98	-6 58 10.2
0282	18.03	23 33 04.11	12 33 15.23	-6 54 54.0
0282	18.03	23 35 02.66	12 35 13.99	-6 54 56.8
0282	19.03	00 50 02.56	13 50 19.75	-6 56 58.6
0282	19.03	00 52 02.53	13 52 19.94	-6 57 02.7
0282	19.03	23 49 03.63	12 53 10.16	-6 55 19.2
0282	19.03	23 51 02.81	12 55 09.72	-6 55 19.7
0283	19.05	22 10 03.38	15 14 23.03	-7 03 07.2
0283	19.05	22 12 02.82	15 16 22.34	-7 03 11.1
0283	19.05	23 35 02.73	16 39 35.60	-7 06 56.3
0283	19.05	23 37 02.73	16 41 36.28	-7 07 00.8
0284	08.09	21 39 02.90	22 04 59.59	-7 20 29.7
0284	08.09	21 41 02.85	22 07 00.07	-7 20 32.8
0285	04.10	21 02 02.96	23 10 24.42	-7 25 24.8
0285	04.10	21 04 02.87	23 12 25.03	-7 25 25.8
0285	07.10	20 59 03.13	23 19 17.72	-7 25 43.2
0285	07.10	21 01 03.10	23 21 18.22	-7 25 43.6
		91015A Astra 1B (c) $L = 19.23$		
0291	15.01	23 15 02.60	08 07 05.76	-6 56 53.3
0291	15.01	23 17 02.76	08 09 06.42	-6 56 46.7
0291	16.01	00 31 02.57	09 23 13.19	-6 54 03.5
0291	16.01	00 33 02.56	09 25 13.34	-6 53 53.0
0291	16.01	22 42 02.67	07 37 57.89	-6 58 16.6
0291	16.01	22 44 02.72	07 39 58.55	-6 58 08.4
0292	18.03	23 33 04.11	12 33 28.26	-6 53 11.6
0292	18.03	23 35 02.66	12 35 27.40	-6 53 14.3
0292	19.03	00 50 02.56	13 50 35.41	-6 54 38.4
0292	19.03	00 52 02.53	13 52 35.58	-6 54 42.3
0292	19.03	23 49 03.63	12 53 28.15	-6 53 25.5
0292	19.03	23 51 02.81	12 55 27.86	-6 53 26.3
0293	19.05	22 10 03.38	15 14 25.38	-6 59 58.5
0293	19.05	22 12 02.82	15 16 24.85	-7 00 04.7
0293	19.05	23 35 02.73	16 39 37.01	-7 04 47.6
0293	19.05	23 37 02.73	16 41 37.44	-7 04 53.9
		83077A Telstar 3A (c) $L = 20.02$		
0301	15.01	23 15 02.60	08 10 36.10	-5 30 50.4
0301	15.01	23 17 02.76	08 12 36.89	-5 30 00.1
0301	16.01	00 31 02.57	09 26 47.25	-5 06 17.2
0301	16.01	00 33 02.56	09 28 47.26	-5 05 42.9
0301	16.01	22 42 02.67	07 41 29.49	-5 42 56.0
0301	16.01	22 44 02.72	07 43 30.39	-5 42 19.1
0302	18.03	23 26 02.57	12 32 16.33	-5 02 02.7
0302	18.03	23 28 02.63	12 34 17.22	-5 01 12.3
0302	19.03	00 45 02.56	13 51 37.23	-4 35 44.1
0302	19.03	00 47 02.46	13 53 37.39	-4 35 18.4
0303	19.05	22 10 03.38	15 18 09.84	-8 57 03.5
0303	19.05	22 12 02.82	15 20 09.95	-8 56 08.4
0303	19.05	23 35 02.73	16 43 36.51	-8 08 17.1
0303	19.05	23 37 02.73	16 45 37.37	-8 06 59.6
		88063B Ecs 5 (c) $L = 21.46$		
0311	15.01	23 09 02.76	08 10 58.78	-5 53 10.9

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) <i>h m s</i>	RA 1950	D 1950
			<i>h m s</i>	<i>°</i> <i>'</i> <i>"</i>
0311	15.01	23 11 02.76	08 12 59.31	-5 52 33.7
0311	16.01	00 25 02.60	09 27 08.38	-5 32 43.9
0311	16.01	00 27 02.57	09 29 08.48	-5 32 20.2
0311	16.01	22 37 02.74	07 42 53.88	-6 02 49.4
0311	16.01	22 39 02.76	07 44 54.37	-6 02 07.4
0312	18.03	23 26 02.57	12 36 17.73	-5 22 17.0
0312	18.03	23 28 02.63	12 38 18.50	-5 22 39.8
0312	19.03	00 45 02.56	13 55 27.27	-5 42 15.0
0312	19.03	00 47 02.46	13 57 27.35	-5 42 58.3
0312	19.03	23 44 03.14	12 58 16.00	-5 26 37.8
0312	19.03	23 46 03.59	13 00 16.63	-5 27 09.9
0313	19.05	22 05 02.78	15 19 31.45	-6 14 34.7
0313	19.05	22 07 02.80	15 21 32.18	-6 15 27.6
0313	19.05	23 30 02.87	16 44 39.63	-6 57 52.0
0313	19.05	23 32 02.63	16 46 39.48	-6 58 56.6
		XXXXX <i>L</i> = 21.69		
0321	15.01	23 09 02.76	08 11 58.83	-6 12 44.2
0321	15.01	23 11 02.76	08 13 56.10	-6 12 21.3
		82014A Westar 4 (d) <i>L</i> = 22.70		
0331	15.01	23 09 02.76	08 16 27.67	-3 39 40.6
0331	15.01	23 11 02.76	08 18 27.98	-3 38 46.6
0331	16.01	00 25 02.60	09 32 22.55	-3 06 25.6
0331	16.01	00 27 02.57	09 34 22.59	-3 05 56.4
0331	16.01	22 37 02.74	07 40 29.33	-4 03 20.2
0331	16.01	22 39 02.76	07 42 29.23	-4 01 55.5
		92066A Dts 3 (Copernicus 3) (c) <i>L</i> = 23.47		
0341	15.01	23 09 02.76	08 19 57.47	-6 57 44.2
0341	15.01	23 11 02.76	08 21 56.98	-6 57 34.2
0341	16.01	00 25 02.60	09 36 04.39	-6 53 42.5
0341	16.01	00 27 02.57	09 38 04.31	-6 53 39.0
0341	16.01	22 37 02.74	07 51 49.57	-6 59 23.2
0341	16.01	22 39 02.76	07 53 49.68	-6 59 14.1
0342	18.03	23 26 02.57	12 45 18.85	-6 56 22.0
0342	18.03	23 28 02.63	12 47 19.42	-6 56 19.3
0342	19.03	00 45 02.56	14 04 27.16	-6 57 25.0
0342	19.03	00 47 02.46	14 06 27.31	-6 57 25.9
0342	19.03	23 44 03.14	13 07 18.03	-6 56 28.4
0342	19.03	23 46 03.59	13 09 18.92	-6 56 30.9
0343	19.05	22 05 02.78	15 28 31.26	-7 02 41.7
0343	19.05	22 07 02.80	15 30 31.84	-7 02 46.2
0343	19.05	23 30 02.87	16 53 41.77	-7 06 50.5
0343	19.05	23 32 02.63	16 55 42.00	-7 06 55.1
0344	08.09	21 34 02.73	22 19 05.15	-7 21 55.3
0344	08.09	21 36 02.85	22 21 05.76	-7 21 57.3
0345	04.10	20 57 02.86	23 24 33.99	-7 21 07.1
0345	04.10	20 59 02.88	23 26 34.46	-7 21 07.4
0345	07.10	20 50 03.10	23 29 22.53	-7 21 30.1
0345	07.10	20 52 02.87	23 31 23.01	-7 21 31.0
		93062D Raduga 30 f.s. (l) <i>L</i> = 23.70		
0351	15.01	23 09 02.76	08 20 54.56	-6 51 24.4
0351	15.01	23 11 02.76	08 22 57.20	-6 51 16.6
0351	16.01	00 25 02.60	09 39 13.74	-6 49 28.7
		93013G Raduga 29 fragment(d) <i>L</i> = 24.16		
0361	7.10	20 50 03.10	23 32 11.72	-6 47 42.2
0361	7.10	20 52 02.87	23 34 11.53	-6 47 15.4
		87078B Ecs 4 (c) <i>L</i> = 25.47		
0371	15.01	23 09 02.76	08 28 48.67	-4 59 22.8
0371	15.01	23 11 02.76	08 30 49.64	-4 58 27.6
0371	16.01	00 25 02.60	09 45 00.98	-4 35 02.2

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU)	RA 1950	D 1950
		h m s	h m s	* * *
0371	16.01	00 27 02.57	09 47 01.77	-4 34 37.0
0371	16.01	22 37 02.74	08 00 45.55	-5 11 44.4
0371	16.01	22 39 02.76	08 02 46.37	-5 10 46.6
0372	18.03	23 26 02.57	12 54 14.07	-4 42 46.0
0372	18.03	23 28 02.63	12 56 15.56	-4 43 31.2
0372	19.03	23 44 03.14	13 16 10.89	-4 51 27.0
0372	19.03	23 46 03.59	13 18 12.71	-4 52 28.7
		90054A Gorizont 20 (c) L = 25.97		
0381	15.01	23 09 02.76	08 31 00.59	-3 59 13.8
0381	15.01	23 11 02.76	08 33 02.03	-3 58 11.3
0381	16.01	22 37 02.74	08 02 42.22	-4 14 47.0
0381	16.01	22 39 02.76	08 04 42.94	-4 13 33.0
0382	18.03	23 26 02.57	12 56 56.71	-4 02 13.0
0382	18.03	23 28 02.63	12 58 58.45	-4 03 21.9
0382	19.03	23 44 03.14	13 18 43.16	-4 15 39.8
0382	19.03	23 46 03.59	13 20 44.80	-4 16 52.5
0383	19.05	22 05 02.78	15 37 23.22	-6 14 06.7
0383	19.05	22 07 02.80	15 39 23.72	-6 15 31.1
0383	19.05	23 30 02.87	17 04 48.46	-7 43 40.4
0383	19.05	23 32 02.63	17 06 47.65	-7 45 00.2
		90063B Dfs 2 (Copernicus 2) (c) L = 28.50		
0391	04.10	20 52 03.18	23 41 41.48	-7 25 11.3
0391	04.10	20 54 02.91	23 43 41.86	-7 25 12.4
0391	07.10	20 45 03.14	23 46 30.90	-7 23 25.0
0391	07.10	20 47 03.27	23 48 31.41	-7 23 27.1
		89062A TV-Sat 2 (c) L = 359.42		
0401	15.01	23 35 02.64	06 59 28.63	-6 57 53.3
0401	15.01	23 37 02.65	07 01 28.71	-6 57 39.1
0401	16.01	00 56 03.58	08 20 37.24	-6 51 35.3
0401	16.01	00 58 02.57	08 22 36.59	-6 51 28.2
0401	16.01	23 04 02.64	06 32 22.00	-7 00 17.5
0401	16.01	23 06 00.78	06 34 20.62	-7 00 05.9
0402	18.03	22 25 02.57	09 57 41.08	-6 53 14.1
0402	18.03	22 27 02.68	09 59 41.53	-6 53 11.3
0402	19.03	01 11 02.60	12 43 55.53	-6 50 11.0
0402	19.03	01 13 02.46	12 45 55.62	-6 50 10.2
0402	19.03	22 56 02.53	10 32 40.94	-6 54 44.6
0402	19.03	22 58 02.82	10 34 41.41	-6 54 41.8
0403	19.05	22 39 02.74	14 15 49.69	-6 57 08.8
0403	19.05	22 41 02.81	14 17 50.10	-6 57 12.0
0403	19.05	23 59 02.70	15 35 56.89	-6 59 42.7
0403	20.05	00 01 02.76	15 37 57.19	-6 59 47.5
0404	08.09	22 00 02.90	20 58 25.59	-7 15 25.6
0404	08.09	22 02 02.94	21 00 25.95	-7 15 33.6
0405	04.10	21 24 03.19	22 04 55.48	-7 14 45.8
0405	04.10	21 26 02.98	22 06 55.73	-7 14 51.3
0405	07.10	21 25 02.80	22 17 45.35	-7 15 24.4
0405	07.10	21 27 02.76	22 19 45.58	-7 15 28.5
		95045D Proton f.s. (d) L = 359.38		
0411	18.03	22 25 02.57	09 57 24.84	-7 50 11.9
0411	18.03	22 27 02.68	09 59 25.51	-7 50 31.8
0411	19.03	01 11 02.60	12 44 11.68	-8 03 46.8
0411	19.03	01 13 02.46	12 46 12.38	-8 03 44.9
0411	19.03	22 56 02.53	10 31 02.27	-7 55 10.8
0411	19.03	22 58 02.82	10 33 03.28	-7 55 25.8
0412	19.05	23 06 02.81	13 17 39.07	-7 46 24.8
0412	19.05	23 08 02.74	13 19 39.97	-7 46 18.0
0412	20.05	00 19 02.83	14 31 02.92	-7 41 15.3
0412	20.05	00 21 02.72	14 33 03.64	-7 41 00.7

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	* † ‡
94034A Intelsat 7 F-2 (c) L = 359.22				
0421	15.01	23 35 02.64	06 58 36.70	-7 00 34.3
0421	15.01	23 37 02.65	07 00 36.92	-7 00 22.6
0421	16.01	00 56 03.58	08 19 48.06	-6 56 28.3
0421	16.01	00 58 02.57	08 21 47.41	-6 56 22.7
0421	16.01	23 04 02.64	06 31 29.97	-7 02 07.2
0421	16.01	23 06 00.78	06 33 28.63	-7 01 59.1
96015A Intelsat 707 (c) L = 359.18				
0422	18.03	22 25 02.57	09 56 31.84	-6 52 03.6
0422	18.03	22 27 02.68	09 58 32.46	-6 52 01.3
0422	19.03	01 11 02.60	12 42 51.22	-6 49 16.0
0422	19.03	01 13 02.46	12 44 51.48	-6 49 16.8
0422	19.03	22 56 02.53	10 31 31.35	-6 50 52.4
0422	19.03	22 58 02.82	10 33 31.99	-6 50 50.5
0423	08.09	22 00 02.90	20 57 25.39	-7 15 28.1
0423	08.09	22 02 02.94	20 59 25.92	-7 15 34.2
0424	04.10	21 24 03.19	22 03 51.63	-7 16 28.6
0424	04.10	21 26 02.98	22 05 51.95	-7 16 34.6
0424	07.10	21 25 02.80	22 15 41.50	-7 17 14.6
0424	07.10	21 27 02.76	22 17 41.93	-7 17 18.4
90074A Marco Polo 2 (Thur) (c) L = 358.98				
0431	15.01	23 35 02.64	06 57 34.14	-7 00 42.6
0431	15.01	23 37 02.65	06 59 34.42	-7 00 31.7
0431	16.01	00 56 03.58	08 18 44.74	-6 56 44.6
0431	16.01	00 58 02.57	08 20 44.25	-6 56 38.8
0431	16.01	23 04 02.64	06 30 26.30	-7 02 13.1
0431	16.01	23 06 00.78	06 32 24.93	-7 02 05.8
0432	18.03	22 25 02.57	09 55 47.24	-6 53 37.6
0432	18.03	22 27 02.68	09 57 47.76	-6 53 33.8
0432	19.03	01 11 02.60	12 42 06.42	-6 50 39.1
0432	19.03	01 13 02.46	12 44 06.66	-6 50 38.1
0432	19.03	22 56 02.53	10 30 46.42	-6 52 23.8
0432	19.03	22 58 02.82	10 32 47.03	-6 52 21.4
0433	19.05	22 39 02.74	14 14 08.22	-6 54 22.4
0433	19.05	22 41 02.81	14 16 08.78	-6 54 26.3
0433	19.05	23 59 02.70	15 34 19.23	-6 57 50.7
0433	20.05	00 01 02.76	15 36 19.70	-6 57 57.1
0434	08.09	22 00 02.90	20 56 26.70	-7 13 45.2
0434	08.09	22 02 02.94	20 58 27.24	-7 13 50.8
0434	08.09	22 05 02.88	21 01 28.01	-7 13 58.7
0434	08.09	22 07 02.63	21 03 28.73	-7 14 06.1
0435	04.10	21 24 03.19	22 03 08.22	-7 16 30.7
0435	04.10	21 26 02.98	22 05 08.60	-7 16 35.7
0435	07.10	21 25 02.80	22 15 56.66	-7 17 12.3
0435	07.10	21 27 02.76	22 17 57.23	-7 17 13.8
90079A Skynet 4C (c) L = 358.99				
0441	15.01	23 35 02.64	06 57 34.72	-6 00 37.5
0441	15.01	23 37 02.65	06 59 35.06	-6 00 47.4
0441	16.01	00 56 03.58	08 18 46.33	-6 12 44.1
0441	16.01	00 58 02.57	08 20 45.71	-6 13 03.1
0441	16.01	23 04 02.64	06 30 25.56	-5 58 20.1
0441	16.01	23 06 00.78	06 32 24.28	-5 58 27.9
0442	18.03	22 25 02.57	09 55 32.21	-6 30 33.9
0442	18.03	22 27 02.68	09 57 33.26	-6 31 09.3
0442	19.03	01 11 02.60	12 41 48.54	-7 16 27.0
0442	19.03	01 13 02.46	12 43 48.75	-7 16 59.5
0442	19.03	22 56 02.53	10 30 30.33	-6 39 39.5
0442	19.03	22 58 02.82	10 32 30.94	-6 40 08.6
0443	19.05	22 39 02.74	14 14 06.08	-7 38 11.9

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU)	RA 1950	D 1950
		h m s	h m s	+ - *
0443	19.05	22 41 02.81	14 16 07.07	-7 38 12.9
0443	19.05	23 59 02.70	15 34 18.82	-7 56 51.5
0443	20.05	00 01 02.76	15 36 19.27	-7 57 17.3
0444	04.10	21 24 03.19	22 03 08.14	-7 57 44.6
0444	04.10	21 26 02.98	22 05 07.99	-7 57 25.7
0444	07.10	21 25 02.80	22 15 59.45	-7 55 07.0
0444	07.10	21 27 02.76	22 17 59.52	-7 54 23.8
		94082D Luch f.s. (d) $L = 355.31$		
0451	19.05	22 44 02.91	14 03 13.82	-8 14 17.2
0451	19.05	22 46 03.89	14 05 15.94	-8 14 08.3
0451	20.05	00 04 02.68	15 24 02.78	-7 53 11.2
0451	20.05	00 06 02.72	15 26 04.18	-7 52 36.8
		92021A Telecom 2B (c) $L = 354.99$		
0461	15.01	23 40 02.71	06 45 04.36	-6 58 13.8
0461	15.01	23 42 02.78	06 47 03.82	-6 58 03.0
0461	16.01	01 01 02.53	08 06 10.62	-6 53 14.5
0461	16.01	01 03 02.56	08 08 10.88	-6 53 04.0
0461	16.01	23 09 02.58	06 17 57.41	-6 59 54.3
0461	16.01	23 11 02.65	06 19 57.61	-6 59 48.5
0462	18.03	22 31 02.65	09 44 13.78	-6 51 30.5
0462	18.03	22 33 02.64	09 46 14.34	-6 51 25.1
0462	18.03	23 39 02.66	10 52 19.53	-6 49 24.1
0462	18.03	23 41 02.58	10 54 19.79	-6 49 22.6
0462	19.03	23 02 02.76	10 19 16.07	-6 50 20.1
0462	19.03	23 04 02.97	10 21 16.41	-6 50 15.1
0463	19.05	22 44 02.91	14 01 34.78	-6 52 19.8
0463	19.05	22 46 03.89	14 03 35.93	-6 52 24.5
0463	20.05	00 04 02.68	15 21 41.38	-6 55 58.6
0463	20.05	00 06 02.72	15 23 41.52	-6 56 04.9
0464	08.09	22 05 02.88	20 44 06.32	-7 14 06.2
0464	08.09	22 07 02.63	20 46 06.49	-7 14 12.4
0465	04.10	21 36 02.75	21 57 32.28	-7 16 03.1
0465	04.10	21 38 02.90	21 59 32.86	-7 16 05.5
0465	07.10	21 30 02.72	22 03 23.29	-7 16 32.0
0465	07.10	21 32 02.71	22 05 23.78	-7 16 35.1
		90016D Raduga 25 f.s. (d) $L = 354.07$		
0471	16.01	01 01 02.53	08 02 09.71	-3 42 04.1
0471	16.01	01 03 02.56	08 04 09.94	-3 41 02.8
0471	16.01	23 09 02.58	08 10 26.80	-5 05 39.0
0471	16.01	23 11 02.65	08 12 27.05	-5 04 01.9
		90102G Gorizont 22 f.s. (d) $L = 354.50$		
0481	19.05	22 44 02.91	13 59 25.74	-5 39 50.6
0481	19.05	22 46 03.89	14 01 30.99	-5 41 15.1
0481	20.05	00 04 02.68	15 17 20.55	-6 15 47.8
0481	20.05	00 06 02.72	15 19 17.52	-6 16 44.6
		94067D Ekspress f.s. (d) $L = 352.45-350.64$		
2341	15.01	23 45 02.63	06 38 57.74	-6 35 42.2
2341	15.01	23 47 02.62	06 40 58.18	-6 35 16.0
2341	16.01	01 06 04.96	08 00 06.55	-6 17 13.3
2341	16.01	01 08 02.56	08 02 03.97	-6 16 46.7
2341	16.01	23 18 02.57	06 17 57.84	-6 44 14.8
2341	16.01	23 20 02.70	06 19 58.80	-6 44 01.3
0491	18.03	22 38 04.25	09 32 14.29	-5 56 43.2
0491	18.03	22 40 02.74	09 34 12.99	-5 56 32.6
0491	19.03	00 04 05.06	10 58 25.16	-5 50 38.0
0491	19.03	00 06 02.69	11 00 23.17	-5 50 35.7
0491	19.03	23 07 05.32	10 05 07.85	-5 53 12.3
0491	19.03	23 09 02.30	10 07 05.77	-5 53 02.8
0491	19.05	22 56 03.00	13 49 13.00	-6 03 36.4

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	*
0491	19.05	22 58 02.72	13 51 12.98	-6 04 01.5
0491	20.05	00 09 02.85	15 02 25.19	-6 23 14.2
0491	20.05	00 11 02.80	15 04 25.57	-6 23 52.2
		93073B Meteosat 6 (c) L = 349.83		
0501	18.03	22 38 04.25	09 28 44.68	-6 58 42.3
0501	18.03	22 40 02.74	09 30 42.54	-6 58 42.0
0501	19.03	00 04 05.06	10 54 55.45	-7 00 04.0
0501	19.03	00 06 02.69	10 56 53.47	-7 00 05.7
0501	19.03	23 07 05.32	10 01 43.24	-6 59 12.3
0501	19.03	23 09 02.30	10 03 41.04	-6 59 15.0
0502	08.09	22 10 02.71	20 27 34.40	-7 20 57.4
0502	08.09	22 12 02.73	20 29 34.65	-7 21 05.4
0503	04.10	21 43 02.88	21 43 59.58	-7 26 45.1
0503	04.10	21 45 02.85	21 46 00.07	-7 26 48.5
0503	07.10	21 35 02.62	21 47 55.49	-7 27 04.7
0503	07.10	21 37 02.70	21 49 56.18	-7 27 05.6
		91084A Telecom 2A (c) L = 351.98		
0511	15.01	23 45 02.63	06 36 53.49	-6 57 54.2
0511	15.01	23 47 02.62	06 38 53.78	-6 57 47.8
0511	16.01	01 06 04.96	07 58 02.54	-6 53 03.6
0511	16.01	01 08 02.96	08 00 00.30	-6 52 54.3
0511	16.01	23 18 02.57	06 13 49.92	-6 59 18.8
0511	16.01	23 20 02.70	06 15 50.52	-6 59 11.8
0512	18.03	22 38 04.25	09 38 06.41	-6 49 55.9
0512	18.03	22 40 02.74	09 40 05.02	-6 49 51.3
0512	19.03	00 04 05.06	11 04 14.76	-6 47 04.9
0512	19.03	00 06 02.69	11 06 12.46	-6 47 02.0
0512	19.03	23 07 05.32	10 11 05.56	-6 48 39.1
0512	19.03	23 09 02.30	10 13 03.11	-6 48 32.8
0513	19.05	22 56 03.00	14 00 21.38	-6 49 56.4
0513	19.05	22 58 02.72	14 02 21.46	-6 50 01.5
0513	20.05	00 09 02.85	15 13 27.86	-6 53 16.4
0513	20.05	00 11 02.80	15 15 28.36	-6 53 23.6
0514	08.09	22 10 02.71	20 36 01.55	-7 12 27.4
0514	08.09	22 12 02.73	20 38 02.14	-7 12 34.4
0515	04.10	21 43 02.88	21 51 32.52	-7 15 05.2
0515	04.10	21 45 02.85	21 53 32.80	-7 15 07.3
0515	07.10	21 35 02.62	21 55 23.74	-7 15 25.6
0515	07.10	21 37 02.70	21 57 23.89	-7 15 29.0
		81114A Satcom 3r (d) L = 348.60		
0521	15.01	23 55 02.66	06 32 12.38	-6 01 59.3
0521	15.01	23 57 02.66	06 34 14.77	-6 01 30.2
0521	16.01	01 06 04.96	07 46 35.68	-4 44 20.6
0521	16.01	01 08 02.56	07 48 37.90	-4 42 32.9
		92043A Gorfont 26 (c) L = 348.53		
0531	15.01	23 55 02.66	06 31 53.46	-6 12 01.9
0531	15.01	23 57 02.66	06 33 52.84	-6 11 19.8
0531	16.01	01 11 02.50	07 48 04.47	-5 46 22.8
0531	16.01	01 13 02.55	07 50 04.33	-5 45 51.7
0531	16.01	23 23 02.66	06 03 43.96	-6 22 49.0
0531	16.01	23 25 02.61	06 05 43.82	-6 22 09.2
0532	18.03	22 44 02.76	09 29 03.15	-5 19 30.1
0532	18.03	22 46 02.65	09 31 03.80	-5 19 15.9
0532	19.03	00 10 02.65	10 55 15.87	-5 14 43.2
0532	19.03	00 12 02.77	10 57 16.42	-5 14 46.1
0532	19.03	23 16 02.95	10 05 05.02	-5 15 58.4
0532	19.03	23 18 02.78	10 07 04.90	-5 15 42.6
0533	19.05	23 01 02.76	13 50 38.40	-5 46 33.1
0533	19.05	23 03 02.76	13 52 39.10	-5 46 59.9

TABLE 3 (continued)

Orbit, arc number	Date 1996	UTC (SU) h m s	RA 1950	D 1950
			h m s	* * *
0533	20.05	00 14 02.79	15 03 44.70	-6 17 12.6
0533	20.05	00 16 02.92	15 05 44.97	-6 18 05.2
		91079A Kosmos 2172 (c) L = 346.44		*
0541	15.01	23 55 02.66	06 22 47.61	-5 57 30.7
0541	15.01	23 57 02.66	06 24 47.95	-5 56 15.9
0541	16.01	01 11 02.50	07 39 01.27	-5 19 56.8
0541	16.01	01 13 02.55	07 41 01.76	-5 19 03.5
0541	16.01	23 23 02.66	05 54 36.52	-6 13 03.7
0541	16.01	23 25 02.61	05 56 36.83	-6 11 45.5
0542	18.03	22 44 02.76	09 16 56.49	-4 42 19.9
0542	18.03	22 46 02.65	09 18 57.26	-4 41 59.7
0542	19.03	00 10 02.65	10 43 17.02	-4 33 07.0
0542	19.03	00 12 02.77	10 45 17.83	-4 33 10.8
0542	19.03	23 16 02.95	09 52 56.50	-4 36 02.0
0542	19.03	23 18 02.78	09 54 56.21	-4 35 53.4
		94060A Kosmos 2291 (c) L = 346.17		*
0551	15.01	23 55 02.66	06 21 39.99	-6 49 23.6
0551	15.01	23 57 02.66	06 23 40.29	-6 49 30.2
0551	16.01	23 23 02.66	05 53 34.70	-6 47 34.8
0551	16.01	23 25 02.61	05 55 35.27	-6 47 39.9
0552	18.03	22 44 02.76	09 20 36.26	-6 57 56.9
0552	18.03	22 46 02.65	09 22 36.84	-6 58 01.0
0552	19.03	00 10 02.65	10 46 45.14	-7 02 00.7
0552	19.03	00 12 02.77	10 48 45.54	-7 02 05.8
0552	19.03	23 16 02.95	09 56 35.80	-6 59 36.3
0552	19.03	23 18 02.78	09 58 36.00	-6 59 41.9
0553	19.05	23 01 02.76	13 41 40.62	-7 04 06.4
0553	19.05	23 03 02.70	13 43 41.03	-7 04 11.3
0553	20.05	00 14 02.79	14 54 49.18	-7 07 30.2
0553	20.05	00 16 02.92	14 56 49.17	-7 07 34.6
0554	04.10	21 51 02.82	21 36 18.60	-7 22 44.2
0554	04.10	21 53 02.99	21 38 19.40	-7 22 46.5
0554	07.10	21 40 02.73	21 37 10.29	-7 22 57.3
0554	07.10	21 42 02.69	21 39 10.73	-7 22 57.4
		94067A Ekspress (c) L = 346.03		*
0561	15.01	23 55 02.66	06 21 02.05	-6 55 08.1
0561	15.01	23 57 02.66	06 23 02.53	-6 55 00.6
0561	16.01	01 11 02.50	07 37 12.87	-6 51 59.8
0561	16.01	01 13 02.55	07 39 13.28	-6 51 55.2
0561	16.01	23 23 02.66	05 52 52.88	-6 56 15.5
0561	16.01	23 25 02.61	05 54 53.46	-6 56 10.2
0562	18.03	22 44 02.76	09 17 30.87	-6 52 02.7
0562	18.03	22 46 02.65	09 19 31.37	-6 52 00.0
0562	19.03	00 10 02.65	10 43 41.92	-6 50 50.6
0562	19.03	00 12 02.77	10 45 42.44	-6 50 49.5
0562	19.03	23 16 02.95	09 53 30.55	-6 51 22.0
0562	19.03	23 18 02.78	09 55 30.84	-6 51 19.5
0563	19.05	23 01 02.76	13 40 03.65	-6 53 42.0
0563	19.05	23 03 02.70	13 42 03.94	-6 53 43.6
0563	20.05	00 14 02.79	14 53 11.74	-6 55 50.4
0563	20.05	00 16 02.92	14 55 11.76	-6 55 53.7
0564	04.10	21 51 02.82	21 33 21.34	-7 09 37.9
0564	04.10	21 53 02.99	21 35 22.30	-7 09 43.7
0564	07.10	21 40 02.73	21 34 13.09	-7 10 19.9
0564	07.10	21 42 02.69	21 36 13.48	-7 10 24.3
		94035A UHF 3 (USA 104) (c) L = 345.74		*
2371	15.01	23 55 02.66	06 19 44.42	-3 58 06.8
2371	15.01	23 57 02.66	06 21 44.78	-3 59 54.6
2371	16.01	01 11 02.50	07 35 47.58	-5 16 10.6

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) <i>h m s</i>	RA 1950	D 1950
			<i>h m s</i>	* † ‡
2371	16.01	01 13 02.55	07 37 47.96	-5 18 22.0
2371	16.01	23 23 02.66	05 51 36.77	-3 33 59.4
2371	16.01	23 25 02.61	05 53 37.05	-3 35 30.8
0571	18.03	22 44 02.76	09 15 40.32	-7 14 21.0
0571	18.03	22 46 02.65	09 17 40.33	-7 16 42.2
0571	19.03	00 10 02.65	10 41 36.27	-8 51 13.4
0571	19.03	00 12 02.77	10 43 36.47	-8 53 18.8
0571	19.03	23 16 02.95	09 51 31.79	-7 55 51.9
0571	19.03	23 18 02.78	09 53 31.87	-7 58 01.7
0572	04.10	21 51 02.82	21 32 05.48	-6 29 11.4
0572	04.10	21 53 02.99	21 34 06.00	-6 27 02.5
0572	07.10	21 40 02.73	21 32 52.23	-6 28 35.6
0572	07.10	21 42 02.69	21 34 52.43	-6 25 56.2
91018A Intarsat 2 F-2 (c) $L = 344.59$				
0581	15.01	23 55 02.66	06 14 46.54	-5 00 26.2
0581	15.01	23 57 02.66	06 16 47.22	-5 00 59.8
0581	16.01	01 11 02.50	07 30 57.52	-5 28 56.7
0581	16.01	01 13 02.55	07 32 58.01	-5 29 51.0
0581	16.01	23 23 02.66	05 46 36.72	-4 53 02.5
0581	16.01	23 25 02.61	05 48 37.36	-4 53 24.1
0582	18.03	22 44 02.76	09 11 35.78	-6 18 44.7
0582	18.03	22 46 02.65	09 13 36.00	-6 19 44.0
0582	19.03	00 10 02.65	10 37 43.07	-7 07 31.7
0582	19.03	00 12 02.77	10 39 43.71	-7 08 36.9
0582	19.03	23 16 02.95	09 47 35.65	-6 38 48.4
0582	19.03	23 18 02.78	09 49 36.00	-6 39 53.9
0583	19.05	23 01 02.76	13 23 06.98	-5 10 26.8
0583	19.05	23 03 02.70	13 35 07.55	-5 11 16.6
0583	20.05	00 14 02.79	14 46 15.94	-5 50 06.5
0583	20.05	00 16 02.92	14 48 16.09	-5 51 10.7
91064A Kosmos 2155 (D) $L = 343.28$				
0591	18.03	22 50 02.73	09 12 36.34	-4 29 56.7
0591	18.03	22 52 02.72	09 14 36.84	-4 29 41.4
0591	19.03	00 17 02.66	10 39 59.95	-4 14 44.3
0591	19.03	00 19 02.69	10 42 00.60	-4 14 48.5
89101A Kosmos 2054 (c) $L = 343.75$				
0601	16.01	00 01 02.65	06 17 08.59	-4 47 51.2
0601	16.01	00 03 02.71	06 19 08.82	-4 45 56.4
0601	16.01	01 16 02.46	07 32 17.85	-3 48 36.8
0601	16.01	01 18 02.63	07 34 18.00	-3 47 15.1
0601	16.01	23 28 02.62	05 48 04.74	-5 14 31.1
0601	16.01	23 30 02.64	05 50 04.98	-5 12 39.3
0602	19.05	23 06 02.81	13 35 29.25	-4 24 44.0
0602	19.05	23 08 02.74	13 37 30.14	-4 26 29.6
0602	20.05	00 19 02.83	14 48 31.96	-5 37 00.4
0602	20.05	00 21 02.72	14 50 31.92	-5 39 06.4
91001A NATO 4A (c) $L = 342.32$				
0611	16.01	00 01 02.65	06 11 00.70	-4 50 11.3
0611	16.01	00 03 02.71	06 13 00.72	-4 50 23.0
0611	16.01	01 16 02.46	07 26 12.66	-5 06 47.4
0611	16.01	01 18 02.63	07 28 13.50	-5 07 12.9
0611	16.01	23 28 02.62	05 41 49.41	-4 47 11.2
0611	16.01	23 30 02.64	05 43 50.03	-4 47 16.8
89006A Intelsat 5A F-15 (c) $L = 341.98$				
0621	16.01	00 01 02.65	06 09 35.06	-6 54 40.1
0621	16.01	00 03 02.71	06 11 35.45	-6 54 32.9
0621	16.01	01 16 02.46	07 24 43.14	-6 48 27.1
0621	16.01	01 18 02.63	07 26 43.71	-6 48 15.5
0621	16.01	23 28 02.62	05 40 26.44	-6 57 01.7

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC (SU)	RA 1950	D 1950
		h m s	h m s	° ′ ″
0621	16.01	23 30 02.64	05 42 26.79	-6 56 49.0 *
0622	18.03	22 50 02.73	09 06 52.56	-6 45 16.5
0622	18.03	22 52 02.72	09 08 52.68	-6 45 10.6
0622	19.03	00 17 02.66	10 34 01.25	-6 42 50.0
0622	19.03	00 19 02.69	10 36 01.63	-6 42 46.8 *
0622	19.03	23 21 02.84	09 41 53.02	-6 49 40.5
0622	19.03	23 23 02.85	09 43 53.10	-6 49 37.4 *
0623	19.05	23 06 02.81	13 27 20.83	-6 47 58.5
0623	19.05	23 08 02.74	13 29 21.30	-6 48 02.0
0623	20.05	00 19 02.83	14 40 28.54	-6 49 46.9
0623	20.05	00 21 02.72	14 42 28.59	-6 49 52.1 *
0624	04.10	21 57 02.95	21 22 04.73	-7 07 35.8
0624	04.10	21 59 02.72	21 24 04.90	-7 07 40.6
0624	07.10	21 45 02.72	21 21 48.98	-7 07 45.9
0624	07.10	21 47 02.76	21 23 49.63	-7 07 52.1
78118C Gorizont 1 f.s. (d) L = 342.58				
0631	20.05	00 19 02.83	14 42 52.39	-4 11 27.5
0631	20.05	00 21 02.72	14 45 20.71	-4 26 32.4
88098A Tdf 1 (c) L = 341.23				
0641	16.01	00 01 02.65	06 06 21.20	-6 54 28.9
0641	16.01	00 03 02.71	06 08 21.83	-6 54 20.8
0641	16.01	01 16 02.46	07 21 31.06	-6 48 16.0
0641	16.01	01 18 02.63	07 23 31.58	-6 48 04.7
0641	16.01	23 28 02.62	05 37 11.55	-6 56 49.0
0641	16.01	23 30 02.64	05 39 11.90	-6 56 37.6 *
0642	18.03	22 50 02.73	09 03 29.13	-6 40 21.8
0642	18.03	22 52 02.72	09 05 29.36	-6 40 18.8
0642	19.03	00 17 02.66	10 30 41.59	-6 38 38.8
0642	19.03	00 19 02.69	10 32 41.81	-6 38 39.5 *
0642	19.03	23 21 02.84	09 38 30.73	-6 43 14.2
0642	19.03	23 23 02.85	09 40 31.23	-6 43 08.5 *
0643	19.05	23 06 02.81	13 23 54.92	-6 44 32.0
0643	19.05	23 08 02.74	13 25 55.41	-6 44 35.9
0643	20.05	00 19 02.83	14 37 05.00	-6 48 01.8
0643	20.05	00 21 02.72	14 39 05.18	-6 48 08.5 *
0644	04.10	21 57 02.95	21 18 22.92	-7 08 59.2
0644	04.10	21 59 02.72	21 20 23.11	-7 09 02.2
0644	07.10	21 45 02.72	21 18 13.68	-7 09 08.9
0644	07.10	21 47 02.76	21 20 14.20	-7 09 16.0
90063A Tdf 2 (c) L = 341.19				
0651	16.01	00 01 02.65	06 06 11.26	-6 51 27.3
0651	16.01	00 03 02.71	06 08 11.96	-6 51 20.7
0651	16.01	01 16 02.46	07 21 21.78	-6 45 54.0
0651	16.01	01 18 02.63	07 23 22.53	-6 45 45.3
0651	16.01	23 28 02.62	05 37 03.79	-6 53 35.1
0651	16.01	23 30 02.64	05 39 04.18	-6 53 24.1 *
0652	19.05	23 06 02.81	13 23 45.83	-6 43 54.0
0652	19.05	23 08 02.74	13 25 46.32	-6 43 59.5
0652	20.05	00 19 02.83	14 36 53.04	-6 46 22.4
0652	20.05	00 21 02.72	14 38 53.16	-6 46 25.8
85087A Intelsat 5A F-12 (c) L = 338.71				
0661	16.01	00 07 02.66	06 01 33.18	-6 22 45.1
0661	16.01	00 09 02.67	06 03 33.30	-6 21 50.0
0661	16.01	01 21 02.57	07 15 39.79	-5 50 03.0
0661	16.01	01 23 02.47	07 17 40.00	-5 49 15.4
0661	16.01	23 35 02.69	05 33 27.47	-6 36 04.9
0661	16.01	23 37 02.75	05 35 27.41	-6 35 20.2 *
0662	18.03	23 01 02.74	09 04 01.48	-5 09 29.7
0662	18.03	22 03 02.73	09 06 01.78	-5 08 56.5

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	* * *
0662	19.03	00 23 02.56	10 26 12.41	-4 56 04.7
0662	19.03	00 25 02.56	10 28 13.04	-4 55 57.3 *
0662	19.03	23 27 02.94	09 33 43.03	-5 05 35.8
0662	19.03	23 29 03.32	09 35 34.71	-5 06 34.8 *
0663	19.05	23 14 02.99	13 21 24.28	-5 14 28.7
0663	19.05	23 16 02.61	13 23 24.34	-5 15 05.9
0663	20.05	00 29 03.06	14 36 31.81	-5 45 11.6
0663	20.05	00 31 03.07	14 38 32.28	-5 45 54.3
92032A Intelsat K (c) L = 338.51				
0671	16.01	00 07 02.66	06 00 41.01	-6 53 54.2
0671	16.01	00 09 02.67	06 02 40.25	-6 53 49.5
0671	16.01	01 21 02.57	07 14 52.63	-6 48 38.5
0671	16.01	01 23 02.47	07 16 52.99	-6 48 30.3
0671	16.01	23 35 02.69	05 32 30.40	-6 55 46.0
0671	16.01	23 37 02.75	05 34 30.66	-6 55 40.7 *
0672	18.03	23 01 02.74	09 02 48.89	-6 45 57.0
0672	18.03	22 03 02.73	09 04 49.42	-6 45 51.8
0672	19.03	00 23 02.56	10 25 00.38	-6 42 34.6
0672	19.03	00 25 02.56	10 26 59.91	-6 42 28.4
0672	19.03	23 27 02.94	09 32 49.51	-6 44 36.3
0672	19.03	23 29 03.32	09 34 50.35	-6 44 33.0 *
0673	19.05	23 14 02.99	13 20 19.78	-6 41 38.8
0673	19.05	23 16 02.61	13 22 19.72	-6 41 43.2
0673	20.05	00 29 03.06	14 35 30.48	-6 44 27.7
0673	20.05	00 31 03.07	14 37 30.94	-6 44 31.7 *
0674	04.10	22 03 02.62	21 14 04.18	-7 04 00.7
0674	04.10	22 05 02.51	21 16 04.65	-7 04 06.3 *
0674	07.10	21 50 02.81	21 12 54.94	-7 04 10.7
0674	07.10	21 52 02.74	21 14 54.72	-7 04 19.9
89077A FleetSatcom 8 (c) L = 337.66				
0681	16.01	00 07 02.66	05 56 59.82	-4 50 12.9
0681	16.01	00 09 02.67	05 59 00.37	-4 50 20.7 *
0681	16.01	01 21 02.57	07 11 10.70	-5 01 26.9
0681	16.01	01 23 02.47	07 13 13.27	-5 01 50.7
0681	16.01	23 35 02.69	05 28 53.04	-4 49 25.9
0681	16.01	23 37 02.75	05 30 53.52	-4 49 25.0 *
0682	18.03	23 01 02.74	08 56 52.70	-5 34 25.5
0682	18.03	22 03 02.73	08 58 52.90	-5 35 13.6
0682	19.03	00 23 02.56	10 18 58.99	-6 11 56.1
0682	19.03	00 25 02.56	10 20 59.36	-6 12 55.5
0682	19.03	23 27 02.94	09 26 43.92	-5 47 06.4
0682	19.03	23 29 03.32	09 28 44.35	-5 48 08.4 *
0683	19.05	23 14 02.99	13 14 50.26	-7 40 41.0
0683	19.05	23 16 02.61	13 16 49.84	-7 41 39.4
0683	20.05	00 29 03.06	14 29 56.24	-8 15 31.7
0683	20.05	00 31 03.07	14 31 56.48	-8 16 22.4
92059A Kosmos 2209 (c) L = 336.27				
0691	18.03	23 01 02.74	08 53 07.42	-5 17 35.2
0691	18.03	23 03 02.73	08 55 06.59	-5 17 16.3
0691	19.03	00 23 02.56	10 14 18.76	-5 06 09.7
0691	19.03	00 25 02.56	10 16 18.34	-5 06 03.5 *
0692	19.05	23 14 02.99	13 11 37.53	-5 22 54.8
0692	19.05	23 16 02.61	13 13 37.39	-5 23 42.6
0692	20.05	00 29 03.06	14 26 44.92	-5 50 00.0
0692	20.05	00 31 03.07	14 28 45.37	-5 50 46.6 *
0693	04.10	22 03 02.62	21 02 16.28	-8 52 03.6
0693	04.10	22 05 02.51	21 04 16.51	-8 52 21.3
0693	07.10	21 50 02.81	21 00 55.51	-8 51 57.6
0693	07.10	21 52 02.74	21 02 56.14	-8 52 18.0

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC (SU)	RA 1950	D 1950
		h m s	h m s	* * *
<b>91064A Kosmos 2155 (b) L = 335.63</b>				
0701	16.01	00 07 02.66	05 48 19.26	-6 03 19.3
0701	16.01	00 09 02.67	05 50 19.24	-6 02 08.8
0701	16.01	01 21 02.57	07 02 32.36	-5 19 18.4
0701	16.01	01 23 02.47	07 04 32.56	-5 18 03.1
0701	16.01	23 35 02.69	05 20 45.84	-6 20 52.0
0701	16.01	23 37 02.75	05 22 46.72	-6 19 36.6
<b>91055A Intelsat 6 F-5 (c) L = 335.49</b>				
0711	16.01	00 07 02.66	05 47 45.24	-6 53 17.3
0711	16.01	00 09 02.67	05 49 45.78	-6 53 08.7
0711	16.01	01 21 02.57	07 01 56.46	-6 48 20.5
0711	16.01	01 23 02.47	07 03 56.85	-6 48 13.0
0711	16.01	23 35 02.69	05 19 35.56	-6 54 58.5
0711	16.01	23 37 02.75	05 21 36.37	-6 54 43.9
0712	18.03	23 01 02.74	08 49 58.30	-6 43 10.7
0712	18.03	23 03 02.73	08 51 59.13	-6 43 03.4
0712	19.03	00 23 02.56	10 12 08.94	-6 39 17.8
0712	19.03	00 25 02.56	10 14 09.60	-6 39 12.6
0713	19.05	23 14 02.99	13 07 17.05	-6 40 26.0
0713	19.05	23 16 02.61	13 09 17.19	-6 40 26.9
0713	20.05	00 29 03.06	14 22 27.01	-6 42 45.1
0713	20.05	00 31 03.07	14 24 27.33	-6 42 48.8
0714	04.10	22 03 02.62	21 00 15.00	-7 03 03.3
0714	04.10	22 05 02.51	21 02 15.66	-7 03 08.4
0714	07.10	21 50 02.81	20 58 59.88	-7 03 08.6
0714	07.10	21 52 02.74	21 01 00.24	-7 03 13.0
<b>94038A Kosmos 2282 (b) L = 334.61</b>				
0721	16.01	00 13 02.57	05 50 00.22	-6 11 47.2
0721	16.01	00 15 02.58	05 52 00.53	-6 12 19.5
0721	16.01	01 32 02.47	07 09 04.75	-6 31 52.8
0721	16.01	01 34 02.55	07 11 05.21	-6 32 19.9
0721	17.01	00 16 02.82	05 56 45.75	-6 12 34.0
0721	17.01	00 18 02.93	05 58 46.27	-6 13 01.3
0722	18.03	23 07 02.70	08 33 38.05	-6 52 08.6
0722	18.03	23 09 02.72	08 35 38.43	-6 52 27.6
0722	19.03	00 29 02.53	09 55 45.51	-7 12 32.8
0722	19.03	00 31 02.57	09 57 46.21	-7 12 55.0
0722	19.03	23 32 03.06	09 02 11.53	-6 59 33.5
0722	19.03	23 34 03.98	09 04 12.82	-6 59 48.6
<b>92088D Kosmos 2224 f.s. (d) L = 333.22</b>				
0731	16.01	00 13 02.57	05 44 07.19	-6 15 20.5
0731	16.01	00 15 02.58	05 46 07.25	-6 15 12.8
0731	16.01	01 32 02.47	07 03 03.85	-6 10 44.6
0731	16.01	01 34 02.55	07 05 04.01	-6 10 43.1
0731	17.01	00 16 02.82	05 48 05.77	-6 13 24.3
0731	17.01	00 18 02.93	05 50 06.00	-6 13 19.9
<b>91075A Intelsat 6 F-1 (c) L = 332.50</b>				
0741	16.01	00 13 02.57	05 41 04.94	-6 51 51.2
0741	16.01	00 15 02.58	05 43 03.74	-6 51 41.6
0741	16.01	01 32 02.47	07 00 17.53	-6 46 22.0
0741	16.01	01 34 02.55	07 02 18.17	-6 46 11.7
0741	17.01	00 16 02.82	05 48 01.02	-6 51 17.5
0741	17.01	00 18 02.93	05 50 01.42	-6 51 13.2
0742	18.03	23 07 02.70	08 43 08.66	-6 43 07.2
0742	18.03	22 09 02.72	08 45 09.28	-6 43 02.0
0742	19.03	00 29 02.53	10 05 22.44	-6 38 37.0
0742	19.03	00 31 02.57	10 07 22.35	-6 38 25.1
0742	19.03	23 32 03.06	09 12 08.75	-6 41 39.6
0742	19.03	23 34 03.98	09 14 09.88	-6 41 34.1

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	°' "
0743	19.05	23 19 02.74	12 59 30.94	-6 38 10.6
0743	19.05	23 21 02.75	13 01 31.07	-6 38 18.0
0743	20.05	00 33 58.49	14 14 36.35	-6 40 17.3
0743	20.05	00 35 57.65	14 16 36.00	-6 40 25.6
0744	04.10	22 09 02.98	20 53 32.35	-7 00 58.0
0744	04.10	22 11 03.15	20 55 33.18	-7 01 05.0
0744	07.10	20 29 03.22	19 25 00.18	-6 56 01.9
0744	07.10	20 31 03.23	19 27 00.66	-6 56 08.9
0744	07.10	21 55 02.76	20 51 16.00	-7 00 59.6
0744	07.10	21 57 02.80	20 53 16.64	-7 01 05.3
93048A Hispasat 1B (c) L = 330.02				
0751	16.01	00 19 02.58	05 36 31.72	-6 50 31.1
0751	16.01	00 21 02.81	05 38 32.33	-6 50 24.0
0751	16.01	01 38 02.46	06 55 41.79	-6 45 47.8
0751	16.01	01 40 02.63	06 57 42.17	-6 45 37.6
0751	17.01	00 22 05.40	05 43 31.77	-6 49 59.5
0751	17.01	00 24 02.83	05 45 29.48	-6 49 52.6
0752	18.03	23 07 02.70	08 32 46.37	-6 39 54.9
0752	18.03	22 09 02.72	08 34 46.86	-6 39 46.8
0752	19.03	00 29 02.53	09 54 57.82	-6 35 14.8
0752	19.03	00 31 02.57	09 56 58.93	-6 35 03.7
0752	19.03	23 32 03.06	09 01 46.25	-6 38 14.6
0752	19.03	23 34 03.98	09 03 47.48	-6 38 09.0
0753	19.05	23 24 02.81	12 54 04.75	-6 33 26.1
0753	19.05	23 26 02.85	12 56 05.03	-6 33 30.5
0753	20.05	00 39 02.75	14 09 12.55	-6 35 55.2
0753	20.05	00 41 02.78	14 11 13.39	-6 36 00.0
92060A Hispasat 1A (c) L = 330.01				
0761	16.01	00 19 02.58	05 36 28.66	-6 49 56.2
0761	16.01	00 21 02.81	05 38 29.19	-6 49 48.3
0761	16.01	01 38 02.46	06 55 40.37	-6 44 33.8
0761	16.01	01 40 02.63	06 57 40.85	-6 44 23.8
0761	17.01	00 22 05.40	05 43 29.69	-6 49 21.6
0761	17.01	00 24 02.83	05 45 27.73	-6 49 16.6
0762	18.03	23 07 02.70	08 32 38.63	-6 42 43.5
0762	18.03	22 09 02.72	08 34 39.03	-6 42 35.5
0762	19.03	00 29 02.53	09 54 49.14	-6 38 38.5
0762	19.03	00 31 02.57	09 56 50.53	-6 38 24.6
0762	19.03	23 32 03.06	09 01 38.14	-6 41 20.2
0762	19.03	23 34 03.98	09 03 39.51	-6 41 19.5
0763	19.05	23 24 02.81	12 53 59.45	-6 36 48.9
0763	19.05	23 26 02.85	12 56 00.02	-6 36 51.5
0763	20.05	00 39 02.75	14 09 08.40	-6 38 34.7
0763	20.05	00 41 02.78	14 11 09.06	-6 38 41.7
83047A Intelsat 5 F-6 (c) L = 328.52				
0771	16.01	00 19 02.58	05 30 09.41	-5 01 53.6
0771	16.01	00 21 02.81	05 32 09.67	-4 59 51.4
0771	16.01	01 38 02.46	06 49 11.51	-3 40 56.5
0771	16.01	01 40 02.63	06 51 11.95	-3 38 37.8
0771	17.01	00 22 05.40	05 37 10.10	-4 53 50.8
0771	17.01	00 24 02.83	05 39 08.06	-4 51 31.6
0772	19.05	23 24 02.81	12 48 03.20	-3 40 14.1
0772	19.05	23 26 02.85	12 50 05.46	-3 41 43.6
0772	20.05	00 39 02.75	14 03 22.74	-4 41 00.4
0772	20.05	00 41 02.78	14 05 23.35	-4 43 17.0
90021A Intelsat 6 F-3 (c) L = 325.48				
0781	16.01	00 19 02.58	05 17 24.51	-6 49 03.7
0781	16.01	00 21 02.81	05 19 25.08	-6 48 57.3
0781	16.01	01 38 02.46	06 36 36.99	-6 43 36.6

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU)	RA 1950	D 1950
		<i>h m s</i>	<i>h m s</i>	<i>a</i> <i>i</i> <i>v</i>
0781	16.01	01 40 02.63	06 38 37.58	-6 43 25.4
0781	17.01	00 22 05.40	05 24 21.02	-6 48 31.0
0781	17.01	00 24 02.83	05 26 19.33	-6 48 24.3 *
0782	18.03	23 19 03.69	08 25 47.99	-6 37 39.7
0782	18.03	23 21 02.74	08 27 47.49	-6 37 31.1
0782	19.03	00 35 02.59	09 41 57.55	-6 33 37.6
0782	19.03	00 37 02.46	09 43 58.25	-6 33 24.3 *
0782	19.03	23 38 03.10	08 48 43.93	-6 37 15.0
0782	19.03	23 40 03.09	08 50 44.06	-6 37 08.9 *
0783	19.05	23 24 02.81	12 35 08.40	-6 32 59.2
0783	19.05	23 26 02.85	12 37 09.05	-6 33 02.0
0783	20.05	00 39 02.75	13 50 18.42	-6 34 32.4
0783	20.05	00 41 02.78	13 52 18.76	-6 34 42.9 *
0784	07.10	20 38 03.53	19 04 30.32	-6 49 36.8
0784	07.10	20 40 03.38	19 06 30.86	-6 49 40.4
0784	07.10	22 00 02.77	20 26 45.58	-6 54 21.8
0784	07.10	22 02 02.74	20 28 46.39	-6 54 25.1
94002D Gals 01 f.s. (d) $L = 325.83$				
0791	18.03	23 19 03.69	08 27 42.09	-5 20 52.0
0791	18.03	23 21 02.74	08 29 40.84	-5 20 30.1
0791	19.03	00 35 02.59	09 43 44.47	-5 05 47.4
0791	19.03	00 37 02.46	09 45 43.84	-5 05 39.8
$L = 0.82, Ll = 0.03, i = 0.4$				
2011	18.03	22 25 02.57	10 03 46.83	-6 29 39.4
2011	18.03	22 27 02.68	10 05 47.43	-6 29 37.0
2011	19.03	01 11 02.60	12 50 09.16	-6 30 34.6
2011	19.03	01 13 02.46	12 52 09.50	-6 30 40.2
2011	19.03	22 56 02.53	10 38 55.38	-6 28 15.8
2011	19.03	22 58 02.82	10 40 56.09	-6 28 11.3
$L = 1.29, Ll = 0.01, i = 0.1$				
2021	15.01	23 35 02.64	07 07 40.96	-7 02 25.8
2021	15.01	23 37 02.65	07 09 39.62	-7 02 13.7
2021	16.01	00 56 03.58	08 28 53.03	-6 59 49.8
2021	16.01	00 58 02.57	08 30 51.75	-6 59 44.2
2021	16.01	23 04 02.64	06 40 34.76	-7 03 34.2
2021	16.01	23 06 00.79	06 42 32.87	-7 03 29.6
$L = 1.26, Ll = 0.08, i = 0.1$				
2022	18.03	22 25 02.57	10 05 44.02	-6 47 30.0
2022	18.03	22 27 02.68	10 07 44.66	-6 47 25.5
2022	19.03	01 11 02.60	12 52 07.72	-6 45 22.8
2022	19.03	01 13 02.46	12 54 08.00	-6 45 24.9
2022	19.03	22 56 02.53	10 41 07.22	-6 46 11.3
2022	19.03	22 58 02.82	10 43 08.12	-6 46 07.7
$L = 2.78, i = 0.4$				
2031	08.09	21 54 02.86	21 07 10.41	-6 57 51.5
2031	08.09	21 56 02.81	21 09 11.00	-6 57 45.5
$L = 2.83, Ll = 0.01, i = 0.4$				
2032	04.10	21 24 03.19	22 04 55.48	-7 14 45.8
2032	04.10	21 26 02.98	22 06 55.73	-7 14 51.3
2032	07.10	21 25 02.80	22 17 45.35	-7 15 24.4
2032	07.10	21 27 02.76	22 19 45.58	-7 15 28.5
$L = 3.98, i = 3.3$				
2041	08.09	21 54 02.86	21 12 30.28	-5 38 47.2
2041	08.09	21 56 02.81	21 14 30.81	-5 37 09.9
$L = 3.95, Ll = 0.01, i = 2.5$				
2051	04.10	21 17 02.94	22 17 47.98	-4 49 38.2
2051	04.10	21 19 02.90	22 19 48.46	-4 48 14.9
2051	07.10	21 16 02.86	22 28 43.96	-4 46 52.7
2051	07.10	21 18 02.94	22 30 44.53	-4 45 36.2

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950 h m s	D 1950 ° ′ ″
<i>L = 3.57, Lt = -0.03, i = 7.5</i>				
2061	04.10	21 17 02.94	22 16 06.96	-6 16 08.4
2061	04.10	21 19 02.90	22 18 04.98	-6 11 13.4
2061	04.10	21 24 03.19	22 22 57.76	-5 58 48.2
2061	04.10	21 26 02.98	22 24 54.88	-5 53 51.9
2061	07.10	21 16 02.86	22 26 37.77	-5 53 58.7
2061	07.10	21 18 02.94	22 28 34.18	-5 49 11.2
<i>L = 5.02, i = 0.8</i>				
2071	04.10	21 17 02.94	22 22 30.64	-7 20 09.7
2071	04.10	21 19 02.90	22 24 31.13	-7 20 12.1
2071	07.10	21 17 02.86	22 33 17.19	-7 25 11.8
2071	07.10	21 18 02.94	22 35 17.86	-7 25 15.6
<i>L = 6.80, Lt = -0.80, i = 5.3</i>				
2081	15.01	23 30 02.72	07 26 55.61	-3 46 22.3
2081	15.01	23 32 02.78	07 28 55.98	-3 44 28.7
2081	16.01	22 53 04.70	06 57 24.75	-4 27 45.2
2081	16.01	22 55 02.69	06 59 22.77	-4 26 05.4
<i>L = 8.76, Lt = -0.80, i = 3.3</i>				
2091	15.01	23 25 02.73	07 30 35.74	-4 01 40.5
2091	15.01	23 27 02.71	07 32 35.72	-4 00 19.0
2091	16.01	00 46 02.61	08 51 31.73	-3 13 12.7
2091	16.01	00 48 02.58	08 53 31.89	-3 12 25.2
2091	16.01	22 53 04.70	06 59 04.89	-4 08 51.1
2091	16.01	22 55 02.69	07 01 02.70	-4 07 18.9
<i>L = 9.77, i = 0.5</i>				
2101	08.09	21 49 03.01	21 33 04.04	-7 49 12.8
2101	08.09	21 51 02.67	21 35 05.23	-7 49 23.7
<i>L = 8.64, Lt = -0.02, i = 0.5</i>				
2102	04.10	21 12 02.80	22 33 31.40	-7 54 41.8
2102	04.10	21 14 03.10	22 35 33.29	-7 54 45.3
2102	07.10	21 10 02.82	22 43 01.15	-7 55 15.1
2102	07.10	21 12 02.86	22 45 02.57	-7 55 18.0
93013A Raduga 29 (c) <i>L = 11.80</i>				
2111	15.01	23 20 02.62	07 39 07.77	-6 26 11.3
2111	15.01	23 22 02.72	07 41 08.44	-6 25 45.1
2111	16.01	00 36 02.54	08 55 17.62	-6 13 04.9
2111	16.01	00 38 06.63	08 57 22.30	-6 12 49.3
2111	16.01	22 48 02.67	07 10 58.94	-6 32 09.3
2111	16.01	22 50 02.70	07 12 59.49	-6 31 43.6
2121	18.03	22 07 02.61	10 32 56.31	-5 58 26.3
2121	18.03	22 09 02.57	10 34 56.80	-5 58 24.1
2121	19.03	00 55 02.61	13 21 18.30	-6 10 28.5
2121	19.03	00 57 02.50	13 23 18.68	-6 10 50.8
2121	19.03	23 58 02.88	12 28 05.66	-6 02 43.6
2121	20.03	00 00 03.00	12 30 06.05	-6 02 57.6
2172	04.10	21 12 02.80	22 46 14.97	-8 44 22.4
2172	04.10	21 14 03.10	22 48 16.10	-8 44 26.7
2172	07.10	21 10 02.82	22 55 55.59	-8 44 49.3
2172	07.10	21 12 02.86	22 57 56.37	-8 44 50.8
<i>L = 12.24, Lt = -1.50, i = 2.3</i>				
2131	15.01	23 20 02.62	07 41 01.20	-5 47 21.5
2131	15.01	23 22 02.72	07 42 58.24	-5 46 45.1
2131	16.01	00 36 02.54	08 54 53.26	-5 27 24.2
2131	16.01	00 38 06.63	08 56 54.17	-5 27 01.6
2131	16.01	22 48 02.67	07 19 30.38	-6 22 40.4
2131	16.01	22 50 02.70	07 21 27.22	-6 22 12.3
<i>L = 12.30, Lt = -0.01, i = 2.3</i>				
2141	04.10	21 07 02.82	22 44 44.72	-4 57 50.0
2141	04.10	21 09 02.89	22 46 45.58	-4 57 27.4

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	* * *
2141	07.10	21 04 02.98	22 54 00.58	-4 56 31.5
2141	07.10	21 06 02.78	22 56 01.14	-4 56 17.4
		L = 12.83, i = 0.9		
2161	19.05	22 15 02.82	14 51 09.45	-6 28 28.2
2161	19.05	22 17 03.02	14 53 09.93	-6 29 04.2
2161	19.05	23 44 02.69	16 20 19.30	-6 56 55.7
2161	19.05	23 46 02.77	16 22 19.42	-6 57 33.0
		L = 12.30, i = 0.8		
2162	08.09	21 44 02.94	21 39 15.70	-8 10 50.4
2162	08.09	21 46 03.06	21 41 16.28	-8 10 47.4
		L = 12.94, i = 1.3		
2171	08.09	21 44 02.94	21 42 07.53	-8 36 45.5
2171	08.09	21 46 03.06	21 44 06.58	-8 37 07.2
		L = 14.94, i = 0.3		
2191	08.09	21 44 02.94	21 51 00.84	-7 14 41.8
2191	08.09	21 46 03.06	21 53 01.23	-7 14 36.7
		L = 16.37, i = 0.1		
2201	08.09	21 39 02.90	21 52 19.69	-7 16 30.7
2201	08.09	21 41 02.85	21 54 20.14	-7 16 36.5
2202	04.10	21 07 02.82	23 02 33.17	-7 21 36.6
2202	04.10	21 09 02.89	23 04 33.98	-7 21 40.1
2202	07.10	21 04 02.98	23 11 22.65	-7 22 15.9
2202	07.10	21 06 02.78	23 13 23.34	-7 22 20.2
		L = 17.02, i = 2.6		
2211	08.09	21 39 02.90	21 55 14.95	-8 14 45.7
2211	08.09	21 41 02.85	21 57 10.18	-8 16 11.2
		96021A Astra 1F (c) L = 19.17		
2231	19.05	22 10 03.38	15 15 09.14	-6 59 22.7
2231	19.05	22 12 02.82	15 17 08.11	-6 59 29.5
2231	19.05	23 35 02.73	16 40 00.58	-7 04 32.3
2231	19.05	23 37 02.73	16 42 00.55	-7 04 39.4
2221	08.09	21 39 02.90	22 04 47.94	-7 22 18.1
2221	08.09	21 41 02.85	22 06 48.45	-7 22 22.3
2222	04.10	21 02 02.96	23 10 13.52	-7 26 29.7
2222	04.10	21 04 02.87	23 12 13.92	-7 26 31.6
2222	07.10	20 59 03.13	23 19 00.07	-7 26 56.1
2222	07.10	21 01 03.10	23 21 00.39	-7 26 59.4
		L = 21.22, i = 3.7		
2241	16.01	00 25 02.60	09 26 04.15	-6 01 20.5
2241	16.01	00 27 02.57	09 28 01.30	-6 01 07.9
2241	16.01	22 37 02.74	07 47 14.44	-4 28 27.3
2241	16.01	22 39 02.76	07 49 11.75	-4 27 24.5
		L = 26.01, i = 0.01		
2251	08.09	21 34 02.73	22 30 11.30	-7 23 27.3
2251	08.09	21 36 02.85	22 32 12.50	-7 23 30.6
		96040A Arabsat 2A (c) L = 26.03		
2252	04.10	20 52 03.18	23 30 42.16	-7 21 32.9
2252	04.10	20 54 02.91	23 32 42.20	-7 21 37.4
2252	07.10	20 45 03.14	23 35 22.88	-7 21 59.3
2252	07.10	20 47 03.27	23 37 23.47	-7 22 02.4
		L = 28.52, i = 15.1		
2261	07.10	20 45 03.14	23 46 33.76	-5 49 39.6
2261	07.10	20 47 03.27	23 49 05.70	-5 38 34.3
		L = 359.70, Lt = 0.01, i = 0.8		
2271	04.10	21 24 03.19	22 06 03.67	-8 06 11.0
2271	04.10	21 26 02.98	22 08 04.05	-8 06 20.9
2271	07.10	21 25 02.80	22 19 02.43	-8 07 25.8
2271	07.10	21 27 02.76	22 21 02.78	-8 07 33.2

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU) h m s	RA 1950	D 1950
			h m s	° ′ ″
$L = 358.05, Lt = -0.64, i = 0.2$				
2281	04.10	21 24 03.19	21 58 49.96	-7 11 53.8
2281	04.10	21 26 02.98	22 00 50.27	-7 11 47.4
2281	04.10	21 36 02.75	22 10 50.59	-7 11 31.6
2281	04.10	21 38 02.90	22 12 51.20	-7 11 27.9
2281	07.10	21 30 02.72	22 08 15.85	-7 11 00.3
2281	07.10	21 32 02.71	22 10 16.26	-7 10 58.3
$L = 357.85, i = 11.5$				
2291	04.10	21 36 02.75	22 09 58.85	-4 14 17.1
2291	04.10	21 38 02.90	22 12 24.56	-4 22 09.3
$L = 356.00, Lt = -0.01, i = 0.2$				
2301	08.09	22 05 02.88	20 48 39.92	-7 13 29.3
2301	08.09	22 07 02.63	20 50 40.09	-7 13 37.3
2302	04.10	21 36 02.75	22 01 53.52	-7 19 07.5
2302	04.10	21 38 02.90	22 03 53.86	-7 19 11.9
2302	07.10	21 30 02.72	22 07 45.48	-7 19 39.1
2362	07.10	21 32 02.71	22 09 45.88	-7 19 44.9
$L = 349.87, Lt = 1.09, i = 2.6$				
2311	15.01	23 45 02.63	06 27 41.11	-6 46 36.5
2311	15.01	23 47 02.62	06 29 41.84	-6 48 01.1
2311	16.01	01 06 04.96	07 49 09.67	-7 44 45.7
2311	16.01	01 08 02.56	07 51 07.94	-7 46 06.0
2311	16.01	23 18 02.57	06 09 18.59	-6 33 33.9
2311	16.01	23 20 02.70	06 11 19.81	-6 34 58.6
$L = 352.24, Lt = -0.19, i = 0.3$				
2321	15.01	23 45 02.63	06 38 00.99	-6 41 42.3
2321	15.01	23 47 02.62	06 40 01.76	-6 41 29.9
2321	16.01	01 06 04.96	07 59 28.35	-6 34 00.2
2321	16.01	01 08 02.56	08 01 26.44	-6 33 47.5
2321	16.01	23 18 02.57	06 15 42.86	-6 41 35.0
2321	16.01	23 20 02.70	06 17 43.41	-6 41 04.5
$L = 352.58, i = 5.2$				
2331	20.05	00 09 02.85	15 16 12.88	-6 05 45.0
2331	20.05	00 11 02.80	15 18 10.59	-6 02 55.1
$L = 348.05, Lt = 0.00, i = 0.2$				
2351	15.01	23 55 02.66	06 29 48.47	-7 00 22.3
2351	15.01	23 57 02.66	06 31 48.28	-7 00 15.7
2351	16.01	01 11 02.50	07 45 58.20	-6 57 01.3
2351	16.01	01 13 02.55	07 47 58.20	-6 56 56.2
2351	16.01	23 23 02.66	06 01 40.66	-7 01 28.5
2351	16.01	23 25 02.61	06 03 40.69	-7 01 22.6
2352	04.10	21 51 02.82	21 42 05.76	-7 12 22.1
2352	04.10	21 53 02.99	21 44 06.68	-7 12 35.2
2352	07.10	21 40 02.73	21 42 51.66	-7 13 12.7
2352	07.10	21 42 02.69	21 44 51.94	-7 13 20.9
$L = 347.97, Lt = 0.00, i = 0.05$				
2361	18.03	22 44 02.76	09 26 39.28	-6 47 59.8
2361	18.03	22 46 02.65	09 28 39.95	-6 47 54.8
2361	19.03	00 10 02.65	10 52 49.95	-6 43 55.7
2361	19.03	00 12 02.77	10 54 50.46	-6 43 52.0
2361	19.03	23 16 02.95	10 02 40.55	-6 46 03.5
2361	19.03	23 18 02.78	10 04 41.22	-6 45 59.0
2362	19.05	23 01 02.76	13 47 52.78	-6 48 43.4
2362	19.05	23 03 03.70	13 49 53.27	-6 48 47.7
2362	20.05	00 14 02.79	15 01 02.04	-6 51 25.6
2362	20.05	00 16 02.92	15 03 02.52	-6 51 30.3
2363	08.09	22 10 02.71	20 18 49.91	-7 05 34.8
2363	08.09	22 12 02.73	20 20 50.56	-7 05 41.5

TABLE 3 (continued)

Orbit. arc number	Date 1996	UTC(SU)	RA 1950	D 1950
		<i>h m s</i>	<i>h m s</i>	<i>+</i> <i>-</i> <i>+</i>
<i>L</i> = 347.25, <i>Lt</i> = -0.02, <i>i</i> = 1.3				
2381	04.10	21 51 02.82	21 38 42.42	-8 30 07.8
2381	04.10	21 53 02.99	21 40 43.10	-8 30 29.3
2381	07.10	21 40 02.73	21 39 15.37	-8 30 24.2
2381	07.10	21 42 02.69	21 41 15.80	-8 30 39.3
<i>L</i> = 335.51, <i>Lt</i> = -0.03, <i>i</i> = 1.5				
2391	19.03	00 23 02.56	10 12 13.01	-5 08 16.8
2391	19.03	00 25 02.56	10 14 13.45	-5 08 06.5
2391	19.03	23 27 02.94	09 20 07.66	-5 07 41.0
2391	19.03	23 29 03.32	09 22 08.28	-5 07 34.3
<i>L</i> = 334.97, <i>Lt</i> = -0.18, <i>i</i> = 2.0				
2401	04.10	22 09 02.98	21 03 53.44	-9 02 25.3
2401	04.10	22 11 03.15	21 05 54.62	-9 02 57.7
2401	07.10	21 55 02.76	20 59 20.58	-9 00 54.5
2401	07.10	21 57 02.80	21 01 21.16	-9 01 34.5
<i>L</i> = 330.68, <i>Lt</i> = -0.17, <i>i</i> = 1.9				
2411	18.03	23 07 02.70	08 35 29.01	-4 11 52.5
2411	18.03	23 09 02.72	08 37 25.09	-4 16 12.0
2411	19.03	00 29 02.53	09 58 54.26	-7 38 48.3
2411	19.03	00 31 02.57	10 01 04.45	-7 44 04.4
2411	19.03	23 32 03.06	09 03 48.02	-5 21 00.2
2411	19.03	23 34 03.98	09 05 48.55	-5 25 50.5
<i>L</i> = 330.96, <i>Lt</i> = -0.01, <i>i</i> = 1.2				
2421	16.01	00 13 02.57	05 34 29.61	-5 33 56.1
2421	16.01	00 15 02.58	05 36 29.97	-5 33 56.2
2421	16.01	01 32 02.47	06 54 21.16	-5 34 38.8
2421	16.01	01 34 02.55	06 56 23.21	-5 34 51.8
2421	17.01	00 16 02.82	05 41 29.10	-5 32 29.7
2421	17.01	00 18 02.93	05 43 30.27	-5 32 29.9
<i>L</i> = 330.82, <i>Lt</i> = -0.18, <i>i</i> = 1.2				
2431	18.03	23 07 02.70	08 36 06.36	-5 47 08.1
2431	18.03	23 09 02.72	08 38 09.54	-5 47 32.7
2431	19.03	00 29 02.53	10 00 21.88	-6 07 02.5
2431	19.03	00 31 02.57	10 02 25.56	-6 07 30.8
2431	19.03	23 32 03.06	09 05 50.70	-5 53 27.8
2431	19.03	23 34 03.98	09 07 54.96	-5 53 56.5
<i>L</i> = 331.89, <i>i</i> = 1.3				
2441	19.05	23 19 02.74	12 57 00.17	-7 00 57.9
2441	19.05	23 21 02.75	12 59 03.86	-7 01 44.2
2441	20.05	00 33 58.49	14 14 01.28	-7 27 37.6
2441	20.05	00 35 57.65	14 16 03.49	-7 28 17.1
<i>L</i> = 333.96, <i>Lt</i> = -0.01, <i>i</i> = 1.3				
2451	04.10	22 09 02.98	20 59 37.64	-8 09 40.7
2451	04.10	22 11 03.15	21 01 36.19	-8 09 21.5
2451	07.10	20 29 03.22	19 32 24.09	-8 19 24.7
2451	07.10	20 31 03.23	19 34 23.93	-8 19 23.8
2451	07.10	21 55 02.76	20 57 26.86	-8 10 04.7
2451	07.10	21 57 02.80	20 59 25.17	-8 09 47.1

**TABLE 4. OSCULATING KEPLERIAN ELEMENTS OF SATELLITES  
OBTAINED BY OBSERVATIONS IN KYIV IN 1996.  
TRUE-OF-DATE EQUATOR AND EQUINOX**

Orbit. arc number	MJD	Incl.	W	Node	M	n	e	Long.	Arc	RMS residual	
	TAI	degr				meter		degr	day	R. A. arc second	Decl. arc second
90093A Inmarsat 2 F-1 (c)											
1011	50123.8653	1.814	351.546	343.659	180.932	42166370.7	0.00038	64.54	14.96	0.18	11.79
XXXXXX											
1031	50361.7502	0.206	177.754	118.141	51.501	42207218.1	0.00206	62.95	0.20	0.80	0.78
89087A Intelsat 6 F-2 (c)											
1041	50100.7934	0.057	60.929	318.349	86.571	42167784.3	0.00008	62.89	23.14	0.27	46.82
1042	50123.8653	0.044	209.331	164.754	140.383	42166104.6	0.00008	62.87	14.96	0.46	32.37
1044	50216.8289	0.013	170.329	343.939	78.456	42166157.1	0.00290	62.92	2.04	1.04	24.27
1046	50361.7502	0.025	28.708	218.714	100.120	42161409.9	0.00029	62.94	0.20	0.16	0.27
90056A Intelsat 6 F-4 (c)											
1061	50100.7934	0.022	63.377	49.350	350.287	42250409.0	0.00148	60.01	0.09	0.51	0.60
1062	50123.8653	0.143	264.882	146.097	100.502	42166288.4	0.00122	60.02	14.97	15.06	105.01
1063	50158.7954	0.019	279.475	141.313	99.885	42166739.4	0.00149	59.98	1.97	3.78	0.56
1064	50216.8289	0.024	235.044	278.236	76.837	42166193.4	0.00029	60.02	2.05	0.46	25.54
1065	50278.8505	0.024	271.897	29.356	357.818	42215496.6	0.00083	60.05	0.08	0.24	0.23
1066	50361.7502	0.027	0.011	223.070	121.549	42160960.4	0.00039	60.03	0.21	0.32	0.43
XXXXXX (c)											
1071	50100.7934	0.024	15.303	59.223	28.380	42212607.6	0.00123	60.00	0.09	0.31	0.36
1072	50123.8653	0.175	183.375	171.163	157.028	42166303.6	0.00020	59.98	14.97	13.40	147.86
1073	50158.7954	0.058	168.132	251.312	101.246	42166746.6	0.00130	59.97	1.97	3.79	0.65
1074	50216.8289	0.089	230.783	272.921	86.389	42165501.8	0.00024	60.00	2.05	0.51	0.89
1075	50278.8505	0.073	24.160	285.385	349.389	42286370.1	0.00217	59.87	0.08	0.59	0.75
1076	50361.7502	0.073	129.784	103.039	111.776	42163542.7	0.00024	59.99	0.21	0.40	0.33
XXXXXX (c)											
1082	50123.8767	0.042	29.865	221.477	261.351	42165762.1	0.00039	56.94	14.95	0.00	0.56
1083	50216.8400	0.068	79.284	265.800	246.020	42166999.2	0.00009	56.95	2.04	0.03	0.99
94064A Intelsat 703 (c)											
1085	50361.7824	0.022	29.826	208.290	115.129	42151426.7	0.00049	57.03	0.18	0.25	0.11
XXXXXX (c)											
1091	50158.8055	0.039	275.332	141.110	104.717	42166936.6	0.00212	56.87	1.96	0.00	0.53
1093	50361.7824	0.091	328.875	260.488	123.894	42159381.9	0.00035	57.03	0.18	0.52	0.42
92066A Dfs 3 (Copernicus 3) (c)											
1162	50123.8882	0.041	36.720	303.888	142.736	42165266.6	0.00033	23.50	8.14	0.57	43.95
1163	50159.7860	0.045	124.536	239.472	117.955	42165518.2	0.00022	23.52	1.12	0.50	38.54
1164	50216.8634	0.069	153.814	272.023	140.260	42167070.6	0.00023	23.52	2.06	0.39	0.42
1165	50257.8608	0.026	76.655	14.831	154.066	42164946.2	0.00030	23.51	1.04	0.00	0.32
1167	50361.8210	0.054	321.726	248.395	123.577	42166354.9	0.00029	23.53	6.13	0.01	0.45
88063B Esc 5 (c)											
1211	50123.9440	1.454	253.620	77.197	170.636	42165658.4	0.00030	21.45	8.08	0.01	3.00
93031A Astru 1C (c)											
1252	50123.8882	0.067	14.440	351.056	113.527	42165224.7	0.00063	19.23	8.15	6.76	40.33
1253	50159.8677	0.010	218.828	7.423	281.060	42166381.9	0.00108	19.23	1.04	17.44	10.56
1254	50216.8634	0.010	70.640	29.657	101.470	42167288.7	0.00035	19.21	2.07	1.14	0.71
1255	50257.8608	0.013	128.331	356.588	116.359	42165727.5	0.00026	19.25	1.06	2.05	3.36
1256	50278.8733	0.010	202.621	348.489	75.185	42166406.5	0.00176	19.23	1.00	18.54	1.03
1257	50361.8210	0.022	5.186	233.680	90.444	42166491.1	0.00139	19.28	6.13	22.61	6.26

TABLE 4 (continued)

Orbit. arc number	MJD	Incl.	W	Node	M	a	e	Long.	Arc	RMS residual	
	TAI		degr			meter		degr	day	R. A. arc second	Decl. arc second
94070A Astra 1D (c)											
1262	50123.8882	0.021	2.351	59.159	57.512	42165185.8	0.00038	19.20	8.15	7.76	14.43
1263	50159.7860	0.015	89.298	311.972	76.270	42166147.1	0.00152	19.24	1.12	18.04	24.48
1264	50216.8634	0.026	249.654	260.568	51.543	42166982.4	0.00023	19.19	2.07	0.60	0.54
1265	50257.9251	0.024	88.199	348.296	187.997	42165901.3	0.00054	19.23	1.00	5.34	8.84
1266	50278.8733	0.059	20.867	62.627	182.988	42166917.0	0.00051	19.22	1.00	28.82	4.85
1267	50361.8210	0.018	332.195	163.915	193.337	42166132.6	0.00062	19.24	6.13	19.72	4.80
95055A Astra 1E (c)											
1272	50123.8882	0.087	3.898	286.500	188.667	42165261.0	0.00033	19.20	8.15	0.94	30.04
1273	50159.7860	0.036	323.941	274.814	239.064	42166072.0	0.00136	19.22	1.12	17.70	19.35
1274	50216.8634	0.079	198.034	287.530	76.098	42165985.8	0.00099	19.17	2.07	5.88	10.21
1275	50257.8608	0.044	334.310	316.280	310.681	42165063.0	0.00004	19.21	1.06	4.39	11.99
1276	50278.8733	0.027	233.759	319.495	72.777	42166743.8	0.00391	19.20	1.00	20.61	6.18
1277	50361.8210	0.026	105.433	311.308	272.773	42166950.9	0.00078	19.23	6.13	27.51	5.92
91015A Astra 1B (c)											
1282	50123.8882	0.058	300.042	334.465	204.553	42165405.5	0.00004	19.19	8.15	0.74	73.90
1283	50159.7860	0.042	79.218	262.732	135.700	42166489.8	0.00037	19.21	1.12	38.64	29.99
1284	50216.8634	0.055	53.401	336.503	171.855	42166928.6	0.00034	19.17	2.07	0.92	0.51
1285	50257.8608	0.046	35.942	3.991	201.361	42165848.1	0.00058	19.21	1.06	2.57	15.64
1286	50278.8733	0.056	356.596	21.500	248.493	42167097.2	0.00136	19.19	1.00	14.99	11.63
1287	50361.8210	0.029	269.183	16.086	44.126	42166347.5	0.00017	19.22	6.13	7.31	2.25
88109A Astra 1B (c)											
1291	50123.8882	0.100	81.718	307.315	89.938	42165530.7	0.00067	19.18	8.15	7.36	52.43
1292	50159.7860	0.055	28.599	252.342	196.712	42165200.9	0.00018	19.18	1.12	0.70	0.39
1293	50216.8634	0.090	102.971	291.111	167.671	42165905.3	0.00024	19.16	2.07	48.46	14.01
1294	50257.8608	0.070	183.160	329.587	88.467	42164790.3	0.00017	19.18	1.06	2.86	15.16
1295	50278.8733	0.075	142.030	26.976	97.381	42166635.2	0.00044	19.18	1.00	5.14	13.51
1296	50361.8210	0.039	138.014	93.410	97.908	42166602.4	0.00047	19.19	6.13	5.40	16.65
96021A Astra 1F (c)											
1302	50257.8608	0.067	46.658	357.490	197.118	42165742.0	0.00034	19.20	1.06	0.20	0.32
1303	50278.8733	0.056	228.065	333.697	64.513	42167154.2	0.00156	19.18	1.00	21.58	5.09
1304	50361.8210	0.034	20.890	79.141	229.391	42166495.8	0.00053	19.18	6.13	7.56	16.46
XXXXXX											
1331	50278.8733	0.077	11.067	254.060	0.806	42078423.4	0.00499	18.69	0.12	1.40	0.72
XXXXXX (d)											
1351	50257.8739	0.291	285.388	59.873	259.930	42177916.4	0.00380	17.99	21.12	0.98	1.28
91083A Eutelsat 2 F-3 (c)											
1372	50159.7982	0.023	204.972	165.184	108.682	42165188.6	0.00025	16.01	1.24	0.72	1.03
1373	50216.8965	0.021	175.855	272.093	122.555	42165617.2	0.00035	16.00	2.04	0.16	47.09
1374	50257.8739	0.022	44.261	48.959	149.517	42165015.7	0.00037	15.99	1.05	0.00	0.10
1375	50278.8839	0.004	253.146	212.267	161.656	42167088.6	0.00030	15.99	0.99	0.00	0.22
1376	50361.8322	0.023	46.389	163.124	120.689	42166546.6	0.00030	16.01	6.08	0.57	0.65
XXXXXX (c)											
1381	50361.8322	0.079	124.865	195.774	9.894	42166213.5	0.00012	16.32	6.08	0.59	0.87
91015B Meteosat 5 (MOP 2) (c)											
1421	50361.9039	0.750	124.094	79.124	136.590	42165163.6	0.00031	359.71	6.07	0.17	0.67
89062A TV-Sat 2 (c)											
1431	50123.9094	0.043	247.675	80.564	138.688	42164890.8	0.00039	359.42	8.14	0.17	19.90
1433	50216.9336	0.076	187.636	282.398	97.215	42167276.1	0.00084	359.43	2.06	1.45	38.95
1434	50257.8853	0.021	83.245	16.532	130.525	42165944.5	0.00042	359.43	21.12	0.97	0.25

TABLE 4 (continued)

Orbit, arc number	MJD	Incl.	W	Node	M	s	e	Long.	Arc	RMS residual	
	TAI		degr		meter			degr	day	R. A. arc second	Decl. arc second
1436	50361.9039	0.063	318.247	250.921	130.355	42166026.1	0.00040	359.44	6.07	1.11	0.42
					94034A Intelsat 7 F2 (c)						
1451	50123.9094	0.043	73.207	255.847	137.466	42164891.5	0.00022	359.00	8.14	0.03	0.34
1453	50216.9336	0.041	217.817	278.661	70.379	42166711.5	0.00075	359.02	2.06	1.37	0.56
1456	50361.9039	0.040	7.923	216.252	115.116	42166029.9	0.00026	359.20	6.07	0.26	0.58
					90074A Marco Polo 2 (Thor) (c)						
1461	50131.9519	0.039	150.878	253.111	85.897	42167526.5	0.00037	359.19	28.95	11.68	1.35
1463	50361.9039	0.036	35.496	236.938	66.680	42166200.4	0.00039	359.04	6.07	0.58	0.48
					90079A Skynet 4C (c)						
1481	50367.9670	1.077	181.033	8.720	178.091	42130189.5	0.00080	359.04	0.02	—	—
					94087D Raduga 32 f.s. (d2)						
1501	50361.9039	0.236	329.436	309.453	58.578	42215849.1	0.00069	357.42	6.08	1.33	1.96
					XXXXXX (c)						
1511	50361.9153	0.048	90.055	121.448	128.716	42165664.4	0.00033	356.02	6.07	0.37	0.21
					XXXXXX (c)						
1521	50257.8853	0.014	105.710	325.064	156.155	42165991.0	0.00032	356.03	21.13	1.75	1.26
1523	50361.9039	0.048	91.772	121.895	122.438	42165707.7	0.00032	356.02	6.07	0.55	0.64
					92021A Telecom 2B (c)						
1532	50123.9215	0.016	254.192	65.302	147.385	42165228.1	0.00051	355.02	8.14	0.31	0.59
1534	50216.9475	0.039	143.937	301.459	122.526	42166612.3	0.00053	355.02	2.06	0.90	0.92
1537	50361.9153	0.015	316.856	264.997	117.355	42165787.6	0.00045	355.02	6.07	1.21	0.91
					91084A Telecom 2A (c)						
1541	50123.9215	0.014	282.608	332.214	209.119	42164768.1	0.00102	352.00	8.19	0.46	0.44
1542	50159.9020	0.020	176.130	168.110	148.070	42166349.5	0.00034	352.00	1.09	0.44	0.49
1543	50216.9475	0.023	80.945	289.425	194.580	42166915.9	0.00029	351.98	2.06	0.86	0.65
1545	50361.9153	0.026	355.287	221.385	119.553	42166005.0	0.00055	352.05	6.07	1.07	50.19
					92043A Gortsost 26 (c)						
1571	50132.0701	1.375	80.853	70.031	10.896	42505151.7	0.00614	348.51	0.04	—	—
					XXXXXX						
1581	50132.0701	0.041	241.595	184.521	95.198	42166996.5	0.00026	347.94	27.89	0.01	0.63

**TABLE 5. OSCULATING KEPLERIAN ELEMENTS OF SATELLITES  
OBTAINED BY OBSERVATIONS IN UZHGOROD IN 1996.  
TRUE-OF-DATE EQUATOR AND EQUINOX**

Orbit. arc number	MJD TAI	Incl.	W	Node	M	a	e	Long.	Alt	RMS residual	
			degr		meter	degr		degr	day	R. A. arc second	Decl. arc second
84023A Intelsat 5 F-8 (d)											
21	50222.9441	4.218	343.080	66.170	168.223	39689333.8	0.06343	1.28	0.06	2.44	6.82
						88018B Telecom 1C (d)					
31	50097.9795	0.513	130.295	82.824	257.527	42167037.2	0.00404	2.98	0.98	3.51	2.31
						95067A Telecom 2C (c)					
41	50160.9302	0.056	101.200	170.599	243.036	42166075.2	0.00294	3.02	1.02	2.17	1.37
42	50222.9407	0.054	252.471	156.493	169.845	40590141.8	0.02939	3.00	0.06	0.41	1.33
44	50360.8921	0.049	74.857	198.401	64.355	42165974.3	0.00219	2.99	3.00	0.00	1.48
						90054D Gorizont 20 f.s. (d)					
61	50097.9795	3.104	203.751	67.707	200.251	42103011.2	0.00058	4.43	0.98	0.25	1.44
						91064B Kosmos 2155 f.s. (d)					
71	50097.9795	2.202	323.554	70.239	77.510	42267520.6	0.00485	4.61	0.98	0.12	1.08
						89027A Tele-X (c)					
81	50097.9795	0.071	145.849	79.414	247.135	42166200.8	0.00166	5.01	0.98	1.04	1.30
82	50160.9302	0.060	85.359	187.134	244.284	42165846.9	0.00276	4.98	1.02	1.11	1.05
83	50222.9407	0.052	166.026	256.197	158.610	41435079.7	0.01380	5.02	0.06	0.27	0.29
						89067A Marco Polo 1 (c)					
91	50160.9302	0.041	100.066	169.469	247.381	42166346.0	0.00216	5.17	1.02	1.96	1.05
						84101A Galaxy 3 (d)					
101	50160.9302	0.976	176.221	83.599	257.554	42285702.3	0.00437	5.37	1.02	0.90	1.56
						93076A NATO 4B (c)					
111	50097.9795	3.082	78.022	314.796	80.056	42164455.7	0.00289	6.01	0.98	1.98	6.20
112	50160.9302	2.718	301.555	312.523	267.245	42165150.9	0.03370	5.94	1.02	0.09	1.83
						92041B Eutelsat 2 F-4 (c)					
121	50097.9795	0.012	124.264	178.558	171.364	42165328.2	0.00034	6.98	0.98	5.96	2.09
122	50160.9261	0.023	253.564	188.679	74.486	42168516.5	0.00267	7.02	1.02	1.90	1.12
123	50222.9407	0.086	259.544	151.843	171.388	40140121.7	0.03775	7.01	0.06	1.21	0.92
124	50334.9094	0.189	332.865	9.516	342.654	46112368.4	0.06943	6.96	0.00	1.12	0.20
						80091A SBS 1 (d)					
131	50222.9372	7.455	179.407	53.470	356.488	81106260.5	0.41743	8.45	0.06	6.61	5.32
						91046D Gorizont 23 f.t. (d)					
141	50222.9372	2.783	356.400	72.294	150.529	36631192.4	0.11293	9.78	0.06	10.21	7.20
						91003B Eutelsat 2 F-2 (c)					
151	50097.9761	0.031	113.233	275.389	87.110	42165120.9	0.00237	10.04	0.98	1.07	0.85
152	50160.9261	0.048	114.408	177.214	228.444	42166155.5	0.00069	10.00	1.02	0.99	12.14
153	50222.9372	0.401	30.943	63.381	125.733	39964491.8	0.05706	10.02	0.06	9.81	9.30
155	50360.8837	0.198	93.124	340.488	271.705	42166289.4	0.03012	10.02	3.00	0.07	1.04
						92088A Kosmos 2224 (c)					
161	50097.9726	0.612	25.817	4.309	86.134	42163300.8	0.00195	11.77	0.98	2.41	0.91
162	50160.9261	0.608	75.456	16.179	69.478	42168520.0	0.00209	11.33	1.02	1.09	1.22
163	50222.9275	0.668	37.362	25.278	160.759	41610194.5	0.01034	12.16	0.06	1.10	0.88
164	50360.8837	0.806	299.240	40.765	3.436	42166619.1	0.00065	11.60	3.00	0.08	0.89
						92074D Ekran 20 f.s. (d)					
171	50160.9219	1.119	212.999	70.389	236.930	41924860.7	0.00211	11.61	1.08	2.61	1.51
						XXXXXX					
181	50222.9372	4.879	169.704	58.798	358.125	43675103.0	0.02632	11.44	0.06	5.87	5.41
						90079B Eutelsat 2 F-1 (c)					
191	50097.9726	0.046	172.506	53.558	251.842	42166037.5	0.00211	12.97	0.98	0.90	1.92
192	50160.9219	0.023	46.214	43.554	71.421	42167393.3	0.00302	13.01	1.08	1.28	1.31

TABLE 5 (continued)

Orbit arc number	MJD TAI	Incl.	W	Node	M	a	e	Long.	Arc	RMS residual	
				degr		meter		degr	day	R. A. arc second	Decl. arc second
193	50222.9275	0.082	223.690	2.719	358.246	43126335.4	0.01697	12.97	0.06	0.14	0.21
194	50360.8802	0.040	49.290	210.832	82.874	42166068.5	0.00522	13.00	3.00	0.02	0.29
95016B Hot Bird 1 (c)											
201	50097.9726	0.026	255.398	330.009	252.489	42165961.2	0.00178	12.99	0.98	0.80	1.89
202	50160.9219	0.032	164.375	277.716	79.213	42167558.3	0.00218	13.05	1.08	1.31	1.20
203	50222.9275	0.070	264.335	322.977	357.336	42660407.9	0.00839	12.98	0.06	0.06	0.20
2181	50360.8802	0.025	141.474	127.270	74.499	42166228.2	0.00336	13.02	3.00	0.02	0.22
91003A Italsat 1 (c)											
211	50097.9726	0.078	164.204	56.588	257.489	42165607.6	0.00293	13.24	0.98	2.20	1.70
212	50160.9219	0.041	47.706	45.059	68.673	42168369.0	0.00220	13.17	1.08	0.62	1.01
213	50222.9275	0.081	154.178	50.576	19.740	42459412.3	0.00607	13.11	0.06	0.39	0.33
215	50360.8802	0.022	78.898	185.898	78.488	42165553.1	0.00428	13.17	3.00	0.05	0.43
91083A Eutelsat 2 F-3 (c)											
231	50097.9726	0.052	100.051	122.615	259.036	42169110.8	0.00905	15.98	0.98	9.25	2.27
232	50160.9219	0.015	245.545	175.169	103.747	42166701.4	0.00036	16.00	1.08	2.14	29.30
233	50222.9275	0.072	263.600	153.877	169.345	40070026.0	0.03919	15.99	0.06	1.55	1.21
235	50360.8802	0.035	106.122	325.343	276.548	42166407.2	0.01239	16.01	3.00	0.06	0.52
94060D Kosmos 2291 f.s. (d)											
241	50222.9240	0.306	88.300	307.035	193.453	41949851.8	0.00490	18.29	0.06	0.87	0.64
93031A Astra 1C (c)											
251	50097.9691	0.076	86.433	310.347	85.423	42164527.5	0.00358	19.16	0.98	0.73	2.91
252	50160.9816	0.050	163.422	300.584	85.046	42166563.0	0.00153	19.16	1.01	1.56	1.04
253	50222.9240	0.100	274.939	334.194	341.071	43182269.3	0.01784	19.16	0.06	0.20	0.19
255	50360.8768	0.037	158.593	101.954	87.463	42166283.4	0.00452	19.19	3.00	0.05	0.51
95055A Astra 1E (c)											
261	50097.9691	0.098	68.313	326.461	87.409	42164262.6	0.00399	19.18	0.98	0.71	2.73
262	50160.9816	0.045	195.258	275.423	78.243	42166676.6	0.00277	19.17	1.01	1.92	1.43
263	50222.9240	0.143	303.217	306.325	340.892	43495324.1	0.02356	19.16	0.06	0.07	0.18
265	50360.8768	0.055	50.881	348.184	311.339	42886243.0	0.02053	19.27	3.00	****	379.20
94070A Astra 1D (c)											
271	50097.9691	0.038	72.606	328.789	80.924	42164251.5	0.00287	19.19	0.98	0.99	2.25
272	50160.9816	0.027	254.521	219.046	75.518	42167573.7	0.00159	19.19	1.01	1.29	0.96
273	50222.9240	0.013	290.290	111.498	187.877	41798741.2	0.00722	19.18	0.06	0.37	0.28
275	50360.8768	0.157	87.158	171.836	87.105	42165466.2	0.02134	19.21	3.00	0.01	0.75
88109B Astra 1A (c)											
281	50097.9691	0.075	11.814	29.386	80.963	42163379.1	0.00458	19.23	0.98	0.94	2.33
282	50160.9816	0.032	109.070	341.742	98.321	42167431.4	0.00111	19.19	1.01	0.97	0.67
283	50222.9240	0.125	14.304	273.403	302.910	42576504.2	0.01090	19.19	0.06	0.18	0.57
285	50360.8768	0.069	96.207	165.683	84.792	42165508.6	0.01635	19.21	3.00	0.05	0.46
91015A Astra 1B (c)											
291	50097.9691	0.091	48.889	348.891	84.386	42164406.8	0.00452	19.23	0.98	0.89	2.33
292	50160.9816	0.032	63.448	44.077	81.158	42166605.6	0.00550	19.24	1.01	1.38	0.58
293	50222.9240	0.058	320.922	294.176	335.212	42996129.6	0.01517	19.20	0.06	0.15	0.25
83077A Telstar 3A (c)											
301	50097.9691	1.793	328.399	73.335	80.942	42163086.9	0.00717	20.02	0.98	0.26	5.40
302	50160.9768	2.270	10.492	140.274	37.457	42478217.1	0.00937	20.55	0.06	0.31	0.64
303	50222.9240	2.660	336.595	273.719	340.699	42987359.9	0.01621	20.05	0.06	1.25	1.30
88063B Ecs 5 (c)											
311	50097.9650	1.387	324.588	75.322	83.093	42163698.1	0.00363	21.46	0.98	0.60	0.96
312	50160.9768	1.526	31.291	76.423	81.521	42167562.5	0.00462	21.46	1.01	1.48	1.98
313	50222.9205	1.703	348.482	79.436	160.828	39432416.4	0.05172	21.48	0.06	0.35	0.93
82014A Westar 4 (d)											
331	50097.9650	3.560	342.347	66.467	75.586	42304807.8	0.00269	22.70	0.98	2.07	6.66

TABLE 5 (continued)

Orbit. arc number	MJD TAI	Incl.	W	Node	M	n	e	Long.	Arc	RMS residual	
				degr		meter		degr	day	R. A. arc second	Decl. arc second
92066A Dfs 3 (Copernicus 3) (c)											
341	50097.9650	0.058	141.497	89.461	254.802	42166248.9	0.00305	23.47	0.98	2.93	0.91
342	50160.9768	0.030	206.690	262.502	82.186	42166945.3	0.00368	23.49	1.01	1.26	1.16
343	50222.9205	0.046	227.114	198.881	165.906	40733324.4	0.02645	23.50	0.06	1.40	1.20
345	50360.8733	0.226	107.431	336.064	273.121	42166063.1	0.04368	23.52	3.00	11.69	3.54
87078B Ecs 4 (c)											
371	50097.9650	2.216	334.269	71.425	81.200	42162593.1	0.00485	25.47	0.98	3.62	3.15
372	50160.9768	2.368	109.506	72.701	11.473	42170977.2	0.00429	25.49	1.01	0.08	3.33
90054A Gorizont 20 (c)											
381	50097.9650	3.257	138.682	69.811	281.831	42165231.5	0.02096	25.97	0.98	0.02	0.66
382	50160.9768	3.351	53.463	66.621	72.229	42174017.1	0.01864	26.10	1.01	0.09	2.37
89062A TV-Sat 2 (c)											
401	50097.9830	0.085	271.767	74.309	121.754	42165459.8	0.00057	359.42	0.98	1.47	4.07
402	50160.9344	0.051	218.352	206.537	87.447	4216676.6	0.00103	359.44	1.02	0.78	73.04
403	50222.9441	0.055	154.464	256.265	165.887	41331862.6	0.01553	359.41	0.06	0.50	0.36
405	50360.8921	0.110	51.834	192.199	88.792	42165824.8	0.01288	359.45	3.00	0.03	0.69
95045D Proton f.s. (d)											
411	50160.9344	1.128	278.275	279.968	314.304	42192216.4	0.00182	359.38	1.02	1.34	1.69
412	50222.9629	0.950	114.237	280.316	169.002	40276355.4	0.03335	339.85	0.05	1.29	1.38
94034A Intelsat 7 F-2 (c)											
421	50097.9830	0.039	79.088	299.360	89.138	42165126.6	0.00091	359.22	0.98	1.09	3.67
96015A Intelsat 707 (c)											
422	50160.9344	0.018	273.861	162.864	75.378	42167005.3	0.00080	359.18	1.02	1.38	1.90
424	50360.8921	0.111	73.140	176.376	83.867	42171827.0	0.00593	359.20	3.00	0.20	0.69
90074A Marco Polo 2 (Thor) (c)											
431	50097.9830	0.041	63.496	293.446	110.470	42165685.5	0.00038	358.98	0.98	1.58	3.77
432	50160.9344	0.032	212.651	215.743	83.588	42166901.3	0.00035	359.01	1.02	1.04	0.63
433	50222.9441	0.037	254.818	153.187	168.077	40772634.1	0.02550	359.03	0.06	0.77	0.54
434	50334.9170	0.913	204.910	274.754	206.605	32523435.5	0.21429	359.19	0.00	0.74	0.34
435	50360.8921	0.043	103.998	238.045	351.865	42166125.9	0.00082	359.04	3.00	0.02	0.90
90079A Skynet 4C (c)											
441	50097.9830	1.103	36.086	344.843	86.347	42165616.6	0.00157	358.99	0.98	1.19	2.75
442	50160.9344	1.055	88.947	350.246	72.439	42168182.8	0.00306	358.95	1.02	2.72	3.16
443	50222.9441	0.734	24.764	22.501	165.152	33336533.4	0.18363	359.18	0.06	2.04	7.54
444	50360.8921	1.118	83.552	6.783	243.820	42165509.5	0.00261	359.04	3.00	0.02	5.88
94082D Luch f.s. (d)											
451	50222.9476	1.709	310.790	274.056	351.183	47610826.6	0.09272	355.31	0.06	1.85	5.18
92021A Telecom 2B (c)											
461	50097.9865	0.042	143.069	66.765	255.366	42166850.0	0.00440	354.99	0.98	2.85	1.86
462	50160.9386	0.018	134.242	285.226	89.723	42165788.7	0.00288	355.00	1.02	1.77	1.39
463	50222.9476	0.049	244.826	327.328	1.716	42465771.7	0.00503	355.00	0.06	0.17	0.12
465	50360.9004	0.056	72.687	173.948	85.801	42165808.8	0.00394	355.02	3.00	18.28	1.16
90016D Raduga 25 f.s. (d)											
471	50098.0427	3.459	340.648	65.134	78.190	42227841.3	0.00149	354.07	0.92	0.21	4.83
94067D Ekspres f.s. (d)											
2341	50097.9900	0.732	303.474	72.767	86.625	42167448.7	0.00493	352.45	0.98	0.69	2.21
491	50160.9435	0.868	186.099	77.686	243.189	42168381.4	0.00045	350.64	62.06	2.66	2.07
93073B Meteosat 6 (c)											
501	50160.9435	0.208	330.889	275.452	260.789	42165425.1	0.00899	349.83	1.02	3.73	1.29
503	50360.9052	0.220	30.316	25.228	275.531	42165116.5	0.00997	350.32	3.00	0.14	0.64
91084A Telecom 2A (c)											
511	50097.9900	0.049	55.850	318.928	87.633	42164052.8	0.00473	351.98	0.98	0.88	1.16
512	50160.9435	0.012	238.817	175.697	93.597	42166737.1	0.00138	351.99	1.02	1.77	1.12

TABLE 5 (continued)

Orbit arc number	MJD TAI	Incl.	W	Node	M	s	e	Long.	Arc	RMS residual	
		degr				meter		degr	day	R. A. arc second	Decl. arc second
513	50222.9559	0.074	253.802	144.711	175.051	40220744.5	0.03626	352.01	0.05	1.40	0.96
515	50360.9052	0.363	85.155	152.461	87.491	42165441.3	0.05719	352.05	3.00	0.01	0.32
92043A Gortont 26 (c)											
531	50097.9969	1.347	129.433	69.941	263.218	42167448.7	0.00507	348.53	0.98	4.32	3.10
532	50160.9476	1.421	354.503	69.983	81.459	42166775.3	0.00334	348.54	1.02	2.18	6.77
533	50222.9594	1.725	323.297	78.776	167.086	36020599.9	0.12230	348.75	0.05	0.42	5.41
91079A Kosmos 2172 (c)											
541	50097.9969	1.948	15.460	70.872	13.590	42166522.6	0.00041	346.44	0.98	0.29	5.31
542	50160.9476	2.051	12.350	71.557	59.500	42167886.7	0.00137	345.75	1.02	3.25	3.37
94060A Kosmos 2291 (c)											
551	50097.9969	0.558	73.914	293.256	91.377	42164241.5	0.00965	346.17	0.98	0.01	0.87
552	50160.9476	0.382	120.164	300.568	83.143	42167023.3	0.00433	346.59	1.02	1.81	0.99
553	50222.9594	0.315	191.628	323.624	53.627	42403042.5	0.00855	346.52	0.05	0.39	0.50
554	50360.9108	0.266	52.821	2.358	274.978	42165476.8	0.01596	346.71	2.99	0.63	0.58
94067A Ekspress (c)											
561	50097.9969	0.113	72.133	303.960	83.065	42165350.2	0.00309	346.03	0.98	1.03	1.86
562	50160.9476	0.119	133.240	289.340	80.807	42166896.9	0.00236	345.87	1.02	1.72	0.91
563	50222.9594	0.140	223.012	311.731	34.000	42536284.0	0.00856	346.15	0.05	0.60	0.66
94035A UHF 3 (USA 104) (c)											
2371	50097.9969	4.448	249.844	317.984	251.478	42166148.5	0.00153	345.74	0.98	1.66	2.97
571	50160.9476	4.362	98.934	317.729	86.408	42167130.6	0.00150	345.45	1.02	1.89	4.70
91018A Inmarsat 2 F-2 (c)											
581	50097.9969	2.250	40.789	332.357	84.528	42165325.3	0.00332	344.59	0.98	1.73	1.92
582	50160.9476	2.147	268.912	334.147	259.437	42165630.5	0.00193	344.51	1.02	2.19	2.69
583	50222.9594	2.216	6.746	70.035	130.030	41747868.1	0.01008	344.56	0.05	0.51	3.93
91064A Kosmos 2155 (I)											
591	50160.9518	2.179	75.918	76.767	351.136	45981873.8	0.06488	343.28	0.06	1.58	7.57
89101A Kosmos 2054 (c)											
601	50098.0011	3.559	310.641	64.241	83.629	42164563.1	0.00242	343.75	0.98	1.23	4.08
602	50222.9629	3.896	337.914	65.284	163.158	38750951.2	0.06533	344.03	0.05	2.21	1.75
91001A NATO 4A (c)											
611	50098.0011	2.096	212.386	347.639	257.424	42166718.0	0.00136	342.32	0.98	2.44	4.49
89006A Intelsat 5A F-15 (c)											
621	50098.0011	0.068	263.316	72.551	121.052	42166168.5	0.00050	341.98	0.98	0.98	3.64
622	50160.9518	0.025	50.203	228.943	222.185	42165735.5	0.00039	342.02	1.02	1.57	157.53
623	50222.9629	0.024	128.203	277.883	159.536	40996268.9	0.02204	342.08	0.05	0.72	0.83
624	50360.9150	0.209	79.533	153.647	88.736	42166116.0	0.02821	342.02	2.99	0.73	0.30
88098A Tdf 1 (c)											
641	50098.0011	0.062	300.518	67.033	88.510	42166083.9	0.00139	341.23	0.98	1.24	3.49
642	50160.9518	0.075	44.658	17.384	78.257	42166115.3	0.00193	341.23	1.02	1.42	107.42
643	50222.9629	0.070	341.384	58.669	164.851	40683426.9	0.02731	341.29	0.05	0.68	0.49
644	50360.9150	0.213	88.022	143.632	89.034	42165471.8	0.03144	341.16	2.99	0.18	0.98
90063A Tdf 2 (c)											
651	50098.0011	0.084	339.245	28.731	88.107	42165481.0	0.00087	341.19	0.98	1.98	4.28
652	50222.9629	0.035	136.801	349.817	78.530	42197380.2	0.00420	341.22	0.05	1.52	1.02
85087A Intelsat 5A F-12 (c)											
661	50098.0052	1.566	121.138	76.396	258.091	42166671.1	0.00369	338.71	0.98	0.43	4.02
662	50160.9594	1.685	158.838	81.364	262.311	42171021.0	0.01477	338.79	1.02	38.24	97.39
663	50222.9684	1.730	140.469	73.043	352.178	44106815.6	0.03336	338.75	0.05	2.42	4.62
92032A Intelsat K (c)											
671	50098.0052	0.069	109.522	82.023	264.251	42168098.0	0.00700	338.51	0.98	3.93	3.78
672	50160.9594	0.065	112.629	306.108	80.583	42167428.9	0.01091	338.51	1.02	1.47	2.48
673	50222.9684	0.021	280.824	310.885	333.460	42384826.9	0.00421	338.54	0.05	0.81	0.56

TABLE 5 (continued)

Orbit arc number	MJD TAI	Incl.	W	Node	M	a	e	Long.	Arc	RMS residual	
				degr		meter		degr	day	R. A. arc second	Decl. arc second
674	50360.9191	0.168	123.603	163.957	35.717	42202230.9	0.00176	338.77	2.99	****	48.47
89077A Fleetcom 8 (c)											
681	50098.0052	1.990	200.371	352.520	262.412	42167858.3	0.01023	337.66	0.98	9.48	2.56
682	50160.9594	1.942	251.084	353.159	255.166	42167954.9	0.00235	337.12	1.02	0.86	2.89
683	50222.9684	1.959	22.925	355.260	185.651	41550016.4	0.01165	337.28	0.05	0.71	0.54
92059A Kosmos 2209 (c)											
691	50160.9594	1.531	246.361	73.817	177.996	40440536.8	0.03793	336.27	0.06	3.40	3.14
692	50222.9684	1.452	144.988	67.133	352.167	47393350.6	0.08571	336.39	0.05	2.41	2.79
693	50360.9191	1.876	151.325	76.009	88.075	42187620.2	0.04575	336.01	2.99	****	43.36
91064A Kosmos 2155 (l)											
701	50098.0052	2.199	304.641	70.414	76.795	42154508.6	0.00256	335.63	0.98	2.46	10.52
91055A Intelsat 6 F-5 (c)											
711	50098.0052	0.037	61.896	306.738	82.919	42165425.2	0.00379	335.49	0.98	1.67	5.18
712	50160.9594	0.149	257.800	69.880	168.776	39156388.1	0.05661	335.59	0.06	2.42	1.78
713	50222.9684	0.038	291.989	103.261	166.022	40797791.2	0.02513	335.54	0.05	0.71	0.85
714	50360.9191	0.635	96.790	314.006	278.655	42171326.3	0.08086	335.56	2.99	534.07	4.66
94038A Kosmos 2282 (l)											
721	50098.0094	1.286	54.109	303.701	94.446	42169546.1	0.00300	334.61	1.00	1.98	19.18
722	50160.9636	1.121	290.651	304.187	259.255	42173184.1	0.00271	330.24	1.02	2.20	7.35
92088D Kosmos 2224 f.s. (d)											
731	50098.0094	0.599	358.130	2.861	89.723	42220610.0	0.00440	333.22	1.00	1.60	28.07
91075A Intelsat 6 F-1 (c)											
741	50098.0094	0.122	99.635	88.906	263.733	42165660.6	0.01565	332.50	1.00	4.81	1.81
742	50160.9636	0.018	198.564	217.495	79.184	42167138.9	0.00706	332.49	1.02	1.13	9.19
743	50222.9719	0.041	17.063	248.584	295.039	42318392.5	0.00512	332.49	0.05	0.37	2.26
744	50360.9233	0.037	140.968	252.098	285.905	42166158.8	0.00261	332.55	2.99	1.20	0.36
93048A Hispasat 1B (c)											
751	50098.0136	0.039	60.582	298.200	90.559	42166065.3	0.00154	330.02	1.00	0.28	1.42
752	50160.9636	0.096	100.266	131.133	262.877	42165061.5	0.00609	330.04	1.02	2.97	6.10
753	50222.9754	0.095	232.394	139.368	187.606	40788203.1	0.02620	330.07	0.05	1.85	1.29
92060A Hispasat 1A (c)											
761	50098.0136	0.029	12.515	352.904	83.874	42165760.1	0.00187	330.01	1.00	1.19	1.17
762	50160.9636	0.095	70.604	161.579	262.422	42164615.0	0.00930	330.00	1.02	3.88	8.64
763	50222.9754	0.127	248.753	136.461	173.063	39099421.2	0.05771	330.11	0.05	1.48	1.38
83047A Intelsat 5 F-6 (c)											
771	50098.0136	4.220	296.469	63.688	87.559	42165521.8	0.00317	328.52	1.00	2.24	11.61
772	50222.9754	4.090	316.137	72.463	164.097	32398633.7	0.20613	329.02	0.05	2.29	7.97
90021A Intelsat 6 F-3 (c)											
781	50098.0136	0.021	36.683	326.334	81.619	42167258.2	0.00307	325.48	1.00	2.27	1.21
782	50160.9719	0.067	93.554	135.211	263.759	42166046.6	0.00387	325.53	1.01	2.23	27.46
783	50222.9754	0.136	271.830	113.088	168.337	38953913.8	0.06059	325.64	0.05	0.37	2.04
784	50363.8601	0.168	253.851	224.482	172.926	39544620.4	0.04877	325.63	0.06	1.74	2.14
94002D Gals 01 f.s. (d)											
791	50160.9719	1.246	61.416	76.597	355.367	47989385.3	0.09405	325.83	0.05	2.19	4.53
XXXXXX											
2011	50160.9344	0.354	7.544	76.118	70.132	42164417.4	0.00044	0.82	1.02	1.44	1.61
XXXXXX											
2021	50097.9830	0.048	317.623	251.629	261.411	42166945.8	0.00810	1.28	0.98	6.88	7.35
2022	50160.9344	0.085	354.216	90.301	69.624	42160515.9	0.00134	1.27	1.02	1.65	0.44
XXXXXX											
2032	50360.8921	0.110	51.834	192.199	88.792	42165824.8	0.01288	359.45	3.00	0.03	0.69
XXXXXX											
2081	50097.9795	5.404	127.776	80.699	266.853	42104111.3	0.01051	6.79	0.98	2.38	29.83

TABLE 5 (continued)

Orbit arc number	MJD TAI	Incl.	W	Node	M	a	e	Long.	Arc	RMS residual	
		degr				meter		degr	day	R. A. arc second	Decl. arc second
2091	50097.9761	3.476	186.629	59.693	228.564 93013A Raduga 29 (c)	42227594.1	0.00150	8.74	0.98	11.15	355.94
2111	50097.9726	0.737	323.650	68.796	83.864 93013A Raduga 29 (c)	42165382.0	0.00177	11.80	0.98	2.05	0.94
2121	50160.9219	0.848	311.174	73.613	135.223	42167404.4	0.00002	11.51	1.08	1.53	1.81
2172	50360.8837	1.231	186.571	76.897	79.005	42166874.7	0.00793	11.52	3.00	0.04	0.53
2131	50097.9726	1.456	238.897	67.254	169.964 XXXXXX	40560838.0	0.04369	12.22	0.05	1.49	1.39
2141	50360.8802	2.326	13.884	269.927	58.883 XXXXXX	42163434.2	0.00223	12.31	3.00	0.08	1.53
2161	50222.9275	0.968	162.444	67.528	354.758 XXXXXX	43702289.7	0.02679	12.82	0.06	0.17	0.64
2202	50360.8802	0.051	176.306	254.810	277.203 96021A Astra 1P (c)	42166028.6	0.01236	16.32	3.00	0.06	0.58
2222	50360.8768	0.113	104.109	155.385	87.439	42166089.7	0.01377	19.17	3.00	0.04	0.56
2231	50222.9240	0.059	309.891	308.054	332.560	43045987.6	0.01442	19.36	0.06	0.22	0.20
2252	50360.8698	0.149	110.639	334.574	271.071 XXXXXX	42166607.8	0.02984	26.03	3.00	0.07	0.41
2281	50360.8921	0.361	105.715	317.941	271.283 XXXXXX	42215632.9	0.01768	358.06	3.01	2.22	1.61
2302	50360.9004	0.116	81.131	344.163	271.519 XXXXXX	42165547.8	0.02561	356.02	3.00	0.15	0.67
2311	50097.9900	2.819	98.610	285.283	76.561 XXXXXX	42079020.4	0.00349	349.87	0.98	1.20	1.49
2321	50097.9900	0.328	345.772	40.172	76.953 XXXXXX	42109363.3	0.00286	352.24	0.98	0.16	1.58
2351	50097.9969	0.073	309.893	253.083	258.813 XXXXXX	42166356.5	0.00233	348.04	0.98	2.35	1.58
2361	50160.9476	0.030	294.541	129.749	80.925	42166809.8	0.00484	347.98	1.02	3.19	0.95
2362	50222.9594	0.173	301.662	287.159	344.130 XXXXXX	45482933.2	0.05694	347.88	0.05	1.47	0.98
2391	50161.0163	1.482	183.001	56.178	279.302 XXXXXX	42164530.4	0.00320	335.52	0.96	0.09	6.36
2401	50360.9233	1.891	343.766	65.216	278.008 XXXXXX	42180021.6	0.05114	335.00	2.99	0.77	2.20
2421	50098.0094	1.268	171.774	359.766	279.024 XXXXXX	42165845.8	0.01406	330.97	1.00	1.93	27.61
2431	50160.9636	1.240	160.880	2.980	331.268 XXXXXX	42165009.4	0.01260	330.88	1.02	0.81	5.47
2441	50222.9719	1.311	177.190	5.998	15.855	42426650.2	0.01817	331.96	0.05	0.56	0.57