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ERS-1 and ERS-2

Manoeuvres History

since

Launch

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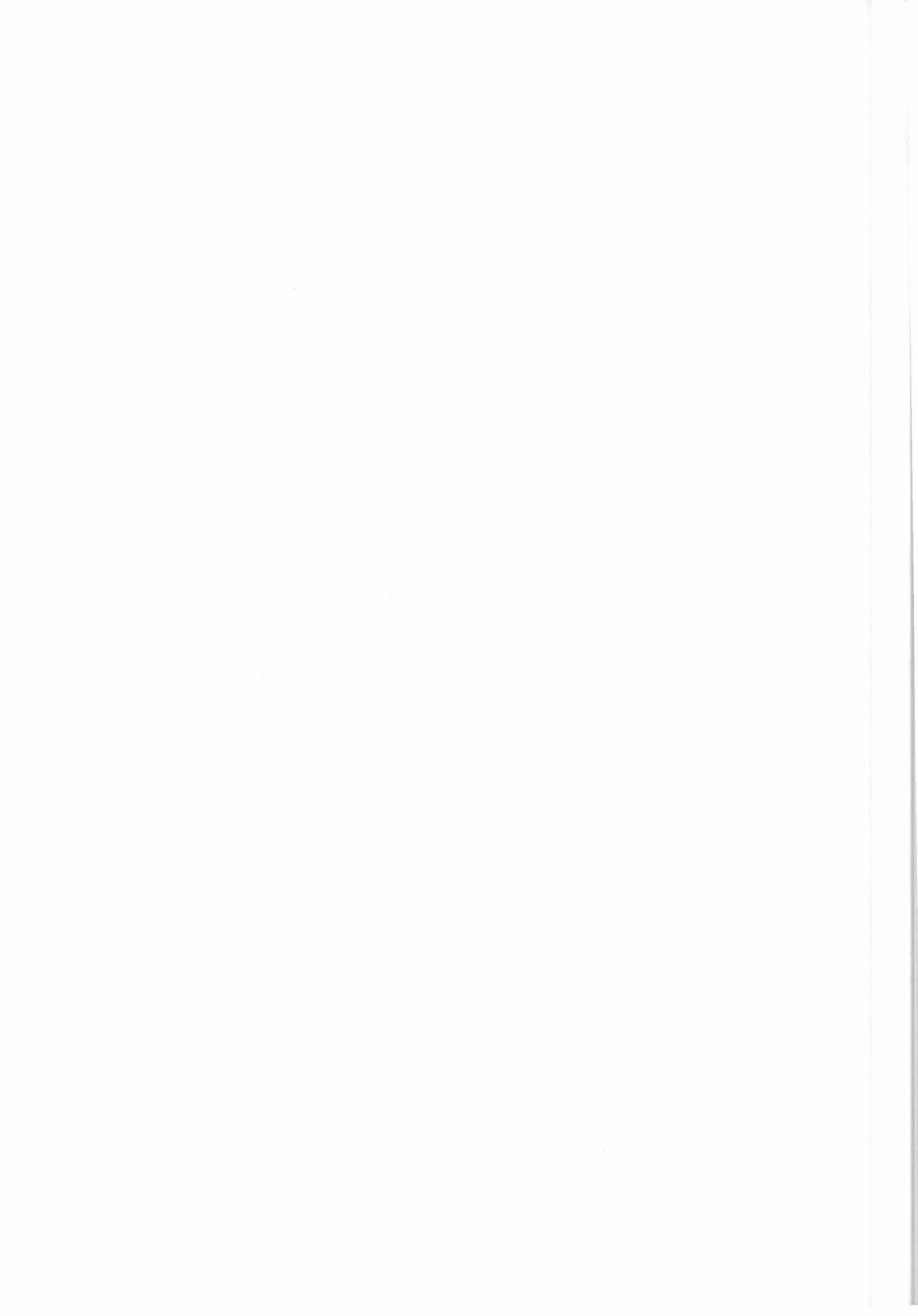
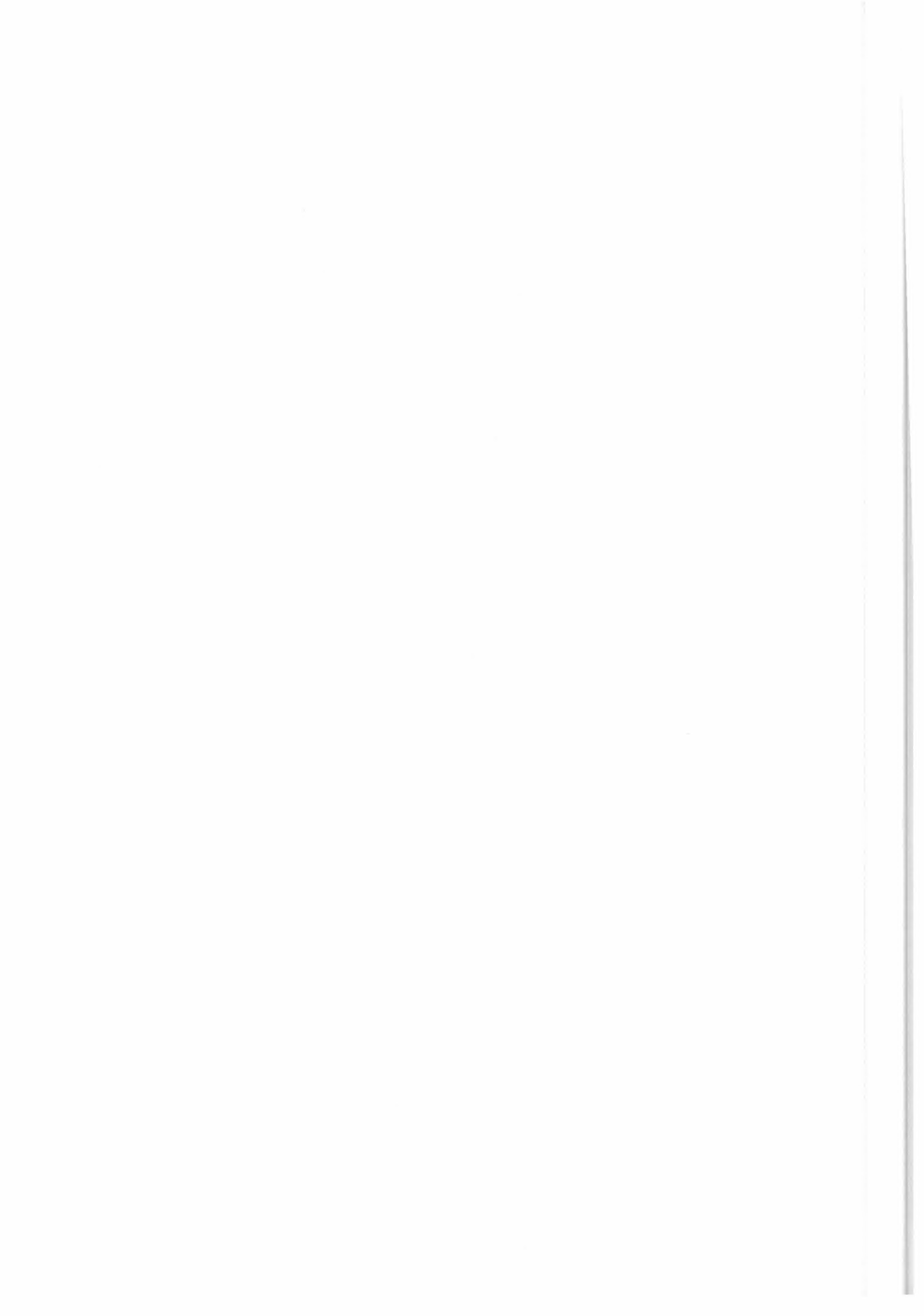




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1 : Introduction

The objective of this technical note is to give all information related to manoeuvres performed on ERS satellites since their launch 17th July 1991 for ERS-1 and 21st April for ERS-2.

In order to give the maximum of information which might be necessary to ERS data users, it has been distinguished different kinds of manoeuvres:

- Platform thruster mode periods.
- Orbit maintenance with Out-Of-Plane manoeuvres
- Orbit maintenance with In-Plane manoeuvres.

1.1 : Platform Thruster Mode periods

These are period during which the Platform stabilisation is controlled by thrusters instead of the reaction wheels during FPM (Fine Pointing Mode) and YSM (Yaw Steering mode).

The Platform Thruster Mode is used in case of :

- Platform maintenance activities
- Platform anomalies.

The platform modes are:

- CAM - Coarse Acquisition Mode
- FAM1 - Fine Acquisition Mode 1
- FAM2 - Fine Acquisition Mode 2

1.2 : Orbit maintenance with Out-Of-Plane manoeuvres

The objective of these manoeuvres is to maintain the orbit eccentricity and requires a stabilisation of three orbits after the manoeuvre itself. These manoeuvres, called OCM (Orbit Control Manoeuvres), are necessary in average twice a year.

OCM are also used to change the orbit characteristics between ERS-1 Mission Phases (Commissioning phase, Ice phase, Multidisciplinary phase, Geodetic phase).

1.3 : Orbit maintenance with In-Plane manoeuvres

The objective of this kind of manoeuvres is to maintain the satellite ground track within the specified deadband (± 1 km). These maintenance manoeuvres, called FCM (Fine Control Mode) are needed in average every 3 or 4 weeks. The duration does not exceed some seconds.





2 : Platform Thruster Mode Periods

The Tables 1 and 2 give the statistics on thruster mode period since launch for ERS-1 and ERS-2. OCM performed during transition phases are not included in these tables.

Table 1: ERS-1 Platform thruster mode periods

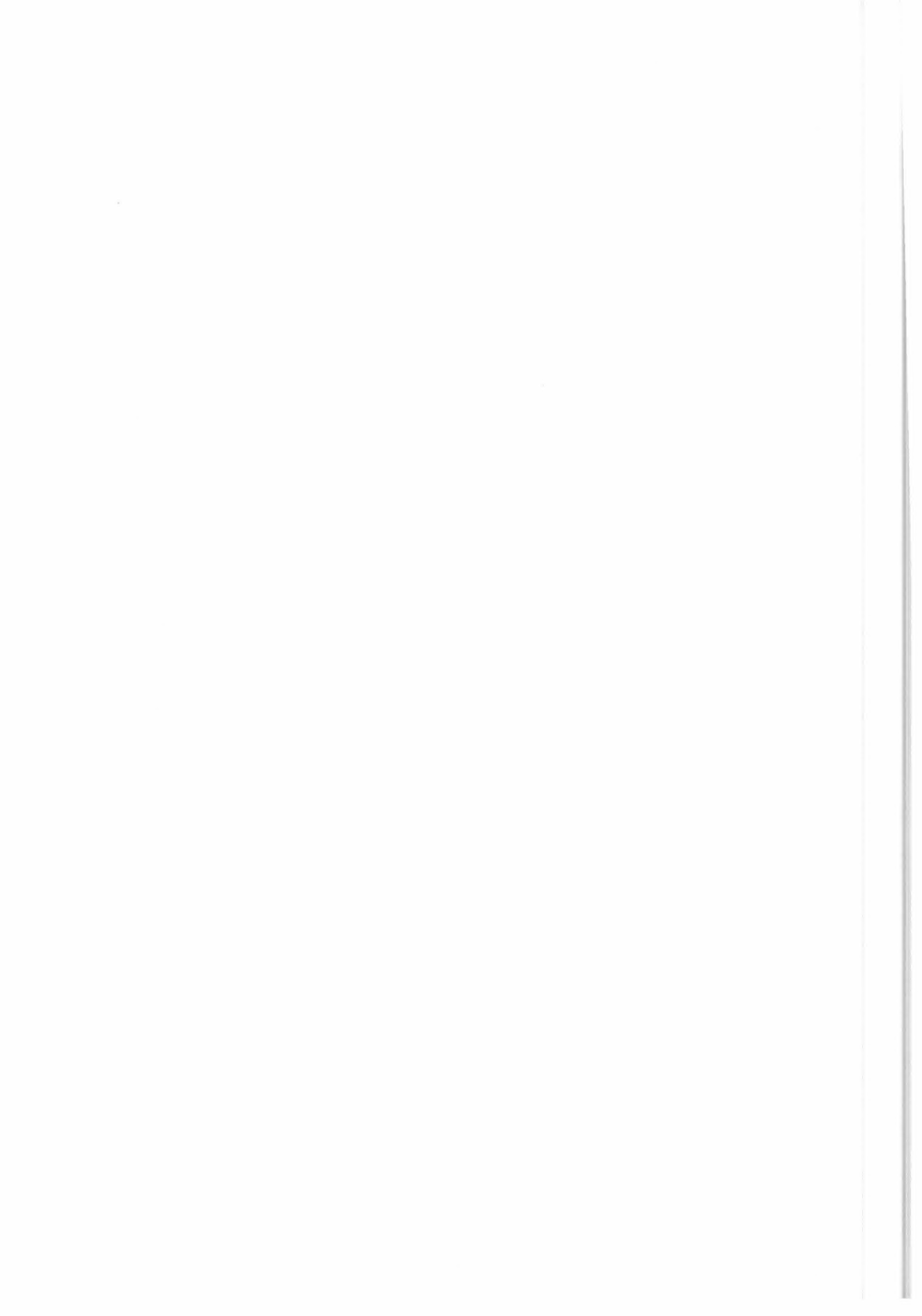
Manoeuvre Start		Manoeuvre Stop		Duration of FPM (s)	Anomaly Report Ref.	Remark
Date	Time	Date	Time			
1992 2 3	10 55 0.0	1992 2 3	12 36 0.0	6,060	ER1-OR-0076	Maintenance of platform gyro configuration
1992 7 19	9 19 0.0	1992 7 20	16 00 0.0	110,060	ER1-OR-0110 ER1-OR-0111	Platform parity error
1992 9 2	14 34 52.0	1992 9 3	9 12 0.0	74,228	ER1-OR-0119	Platform parity error
1992 12 16	12 53 52.0	1992 12 16	18 45 56.0	21,124	N/A	OCM manoeuvre (#)
1993 5 4	11 44 48.0	1993 5 4	17 36 54.0	21,126	N/A	OCM manoeuvre (#)
1994 2 21	5 30 31.0	1994 2 21	11 22 08.0	21,097	N/A	OCM manoeuvre (#)
1994 12 16	0 0 54.0	1994 12 16	5 52 06.0	21,072	N/A	OCM manoeuvre (#)
1995 3 19	9 46 51.0	1995 3 19	17 18 23.0	27,092	N/A	OCM manoeuvre (#)
1995 9 5	7 16 20.0	1995 9 5	13 08 26.0	21,126	N/A	OCM manoeuvre (#)
1995 11 15	6 27 28.0	1995 11 15	11 46 30.0	19,142	N/A	OCM manoeuvre (#)

Table 2: ERS-2 Platform thruster mode periods

Manoeuvre Start		Manoeuvre Stop		Duration of FPM (s)	Anomaly Report Ref.	Remark
Date	Time	Date	Time			
1995 9 6	7 16 22.0	1995 9 6	15 39 22.0	30,180	N/A	OCM manoeuvre (#)
1995 11 14	5 17 4.0	1995 11 14	11 09 10.0	21,126	N/A	OCM manoeuvre (#)

- OCM manoeuvres includes three steps:

- 1) start - transition from YSM to FSM
- 2) OCM manoeuvres 1/2 hour later
- 3) Stabilisation required during 3 orbits





3 : ERS-1 Manoeuvres

The following table 3 give sthe complete list of ERS-1 manoeuvres since launch. They include all OCM and FPM manoeuvres up to December 1995.

Table 3: ERS-1 Manoeuvres file

Date	Time		Acceleration (km/s/s)			Date Julian day
	Start	Stop	Radial	Along track	Across track	
1991 7 21	2 57 14.5	3 0 27.5	0.44848278D-06	-0.19188395D-06	-0.10416311D-04	151750000201
1991 7 22	2 24 41.5	2 27 18.5	0.43161665D-06	0.10273845D-04	0.20125740D-06	151760000401
1991 7 26	18 34 13.5	18 35 56.5	0.46743807D-06	-0.10856060D-04	0.19700276D-06	151810000101
1991 7 26	19 25 4.0	19 25 24.0	0.46981142D-06	0.11182500D-04	0.21699999D-06	151810000102
1991 8 13	10 59 40.0	10 59 44.0	0.40943348D-06	0.92580460D-05	-0.38973963D-06	151950002601
1991 8 24	21 26 31.0	21 26 33.0	0.38128625D-06	-0.94030688D-05	0.48967189D-06	152090002101
1991 8 24	22 16 44.0	22 16 52.0	0.42354474D-06	0.94867065D-05	0.53228177D-06	152090002102
1991 9 7	19 35 33.0	19 35 37.0	0.47395305D-06	0.10563983D-04	0.78655404D-06	152230002101
1991 9 7	20 25 44.5	20 25 45.5	0.19329898D-06	0.43022942D-05	-0.20321172D-06	152230002102
1991 9 22	15 32 5.5	15 32 6.5	0.12271859D-06	0.28529779D-05	-0.17013953D-06	152370002101
1991 9 22	16 22 22.0	16 22 26.0	0.36692947D-06	0.85413300D-05	0.73970239D-06	152370002102
1991 9 26	13 46 51.0	13 46 53.0	0.36566434D-06	0.86056470D-05	0.20864281D-06	152420002101
1991 9 26	14 37 4.5	14 37 5.5	0.33525662D-06	0.78883700D-05	0.10854489D-06	152420002102
1991 10 3	3 23 52.0	3 23 56.0	0.44147186D-06	0.98314741D-05	0.72753982D-06	152490002101
1991 10 3	4 14 4.0	4 14 6.0	0.38544835D-06	0.85939465D-05	-0.30781959D-06	152490002102
1991 10 24	10 19 57.0	10 20 3.0	0.38364375D-06	0.94005723D-05	0.80702377D-06	152700002101
1991 10 24	11 10 8.5	11 10 11.5	0.32033971D-06	0.78683061D-05	-0.37110194D-06	152700002102
1991 10 31	8 4 58.5	8 5 1.5	0.39103140D-06	0.95040524D-05	0.83822363D-06	152770002101
1991 10 31	8 55 8.0	8 55 12.0	0.43278583D-06	0.10538375D-04	-0.51467611D-06	152770002102
1991 11 13	17 34 57.0	17 35 3.0	0.41760725D-06	0.10209701D-04	0.88510010D-06	152900002101
1991 11 13	18 25 8.5	18 25 11.5	0.33982641D-06	0.83254918D-05	-0.40039433D-06	152900002102
1991 12 6	13 19 59.0	13 20 1.0	0.31002447D-06	0.78400827D-05	0.42634795D-06	153130002101
1991 12 6	14 10 10.5	14 10 13.5	0.30966417D-06	0.78491881D-05	-0.12234423D-06	153130002102
1991 12 13	9 53 42.0	9 55 18.0	0.44537585D-06	0.10600582D-04	0.20447603D-06	153190002101
1991 12 13	10 27 12.0	10 28 50.0	0.44037622D-06	0.10481376D-04	0.20132347D-06	153190002102
1991 12 17	10 21 27.5	10 26 12.5	0.43839347D-06	-0.33681353D-06	0.10176801D-04	153240002201
1991 12 19	13 34 42.0	13 37 16.0	0.43165491D-06	-0.10025501D-04	0.10000000D-09	153260002201
1991 12 21	1 35 40.5	1 36 21.5	0.42664621D-06	-0.99090271D-05	0.10000000D-09	153280002201

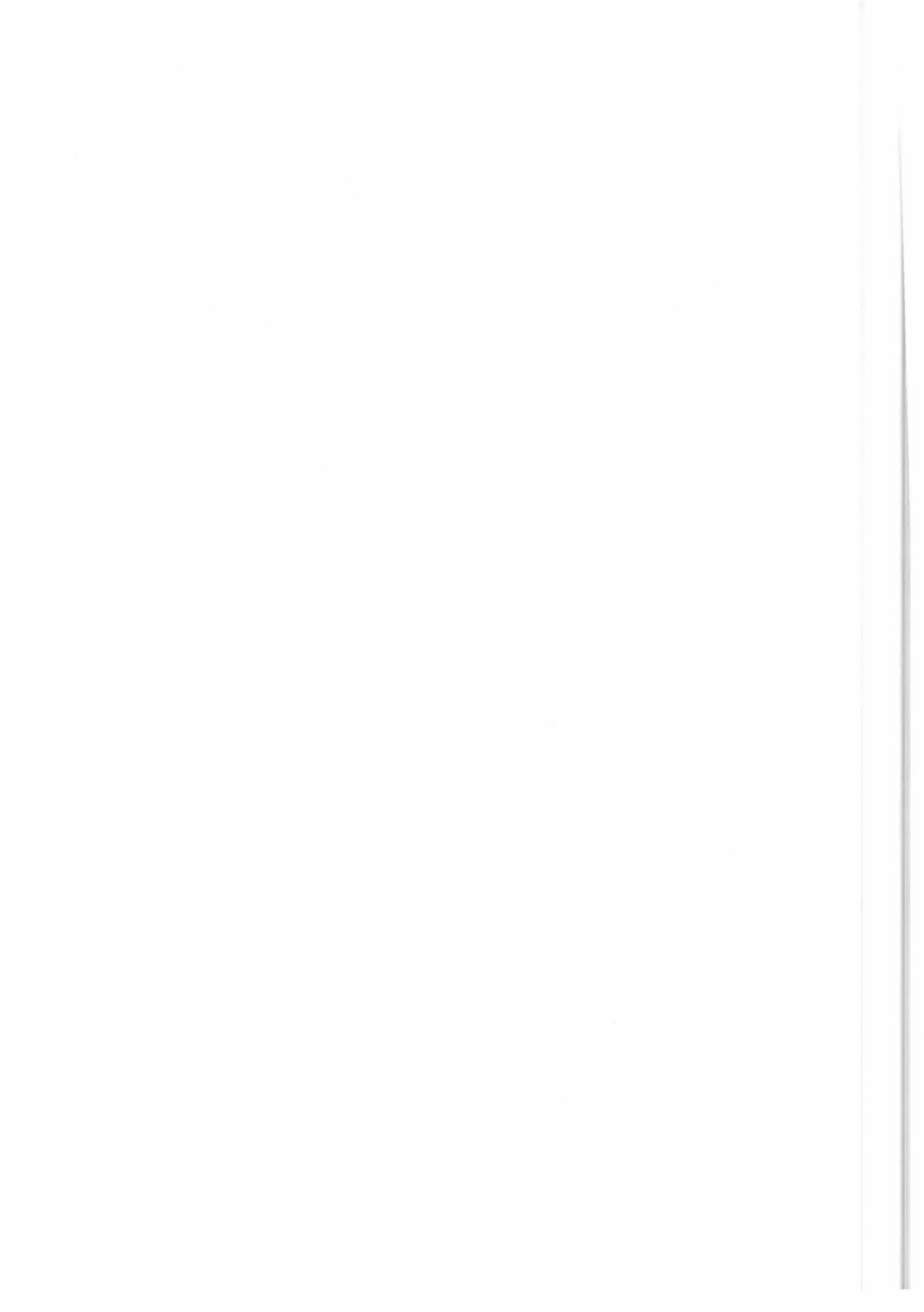




Table 3: ERS-1 Manoeuvres file

Date	Time		Acceleration (km/s/s)			Date Julian day
	Start	Stop	Radial	Along track	Across track	
1991 12 23	21 51 47.0	21 51 49.0	0.38211498D-06	0.85178121D-05	0.50158346D-06	153310002101
1991 12 23	22 41 59.0	22 42 1.0	0.29385708D-06	0.65609223D-05	-0.13395722D-06	153310002102
1992 1 6	18 12 22.5	18 12 29.5	0.42186890D-06	0.94670127D-05	-0.14835069D-06	153450002101
1992 1 6	19 2 41.0	19 2 43.0	0.33155468D-06	-0.81822692D-05	-0.15382969D-06	153450002102
1992 1 14	13 34 57.0	13 35 3.0	0.36872146D-06	0.88475411D-05	0.20503451D-06	153520002101
1992 1 14	14 25 13.5	14 25 14.5	0.40957410D-06	-0.94296723D-05	0.18147331D-06	153520002102
1992 1 30	12 59 54.5	13 0 5.5	0.37842953D-06	0.91992244D-05	0.27233402D-06	153680006101
1992 1 30	13 50 10.0	13 50 16.0	0.40909317D-06	0.93019978D-05	0.25907339D-06	153680006102
1992 2 4	2 17 41.5	2 17 54.5	0.40161107D-06	0.95381752D-05	-0.47535444D-06	153730002201
1992 2 4	3 8 3.0	3 8 11.0	0.40911935D-06	-0.94914927D-05	-0.48667971D-06	153730002202
1992 2 11	1 43 17.0	1 43 23.0	0.35387768D-06	0.83318352D-05	-0.42022238D-06	153800002101
1992 2 11	2 33 38.5	2 33 39.5	0.11188566D-06	0.26254226D-05	0.20173858D-06	153800002102
1992 2 22	23 51 37.5	23 51 44.5	0.39691659D-06	0.88328331D-05	-0.27001194D-06	153910002101
1992 2 23	0 41 57.5	0 41 58.5	0.34131919D-06	-0.84929160D-05	-0.28226315D-06	153910002102
1992 2 27	16 53 16.0	16 53 18.0	0.32453382D-06	0.72145138D-05	0.50139780D-06	153960002101
1992 2 27	17 43 26.0	17 43 30.0	0.36909029D-06	0.82126507D-05	-0.26031640D-06	153960002102
1992 3 3	1 37 1.0	1 37 7.0	0.41257595D-06	0.92996766D-05	-0.40048490D-06	154010002101
1992 3 3	2 27 21.5	2 27 22.5	0.15990184D-06	-0.39081771D-05	-0.21438642D-06	154010002102
1992 3 20	1 17 54.0	1 17 56.0	0.31587640D-06	-0.78247176D-05	-0.30714056D-06	154180002201
1992 3 20	2 8 0.5	2 8 9.5	0.39164157D-06	0.87462463D-05	-0.32866275D-06	154180002202
1992 3 31	11 59 1.0	12 8 51.0	0.43488319D-06	0.10000000D-09	0.10099634D-04	154290002401
1992 4 2	15 59 31.0	16 2 29.0	0.39733881D-06	0.94559427D-05	0.10000000D-09	154310002101
1992 4 2	16 48 39.0	16 51 43.0	0.39113582D-06	0.93079887D-05	0.10000000D-09	154310002102
1992 4 4	2 6 6.5	2 6 9.5	0.35673932D-06	-0.88426228D-05	0.51102525D-06	154330002201
1992 4 4	2 56 27.0	2 56 29.0	0.24850495D-06	-0.61775583D-05	-0.14464259D-06	154330002202
1992 4 27	21 52 18.5	21 52 29.5	0.39661816D-06	0.88237285D-05	-0.27440393D-06	15457000201
1992 4 27	22 42 44.0	22 42 48.0	0.29738535D-06	-0.74017469D-05	-0.23652492D-06	15457000202
1992 4 29	19 39 21.0	19 39 23.0	0.27886022D-06	-0.61602840D-05	0.29384009D-06	15459000201
1992 5 22	2 18 41.0	2 18 49.0	0.33485983D-06	0.83829773D-05	-0.38163193D-06	15481000201
1992 5 22	3 9 5.0	3 9 9.0	0.38995743D-06	-0.86156588D-05	-0.40728586D-06	15481000202
1992 6 26	2 47 24.5	2 47 27.5	0.37969296D-06	0.84691034D-05	0.48724574D-06	15516000201
1992 7 23	22 50 52.5	22 50 57.5	0.37539151D-06	-0.90478034D-05	0.33274823D-06	155440000401
1992 7 23	23 41 12.0	23 41 16.0	0.34962130D-06	0.80079931D-05	0.30352375D-06	155440000402



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Date	Time		Acceleration (km/s/s)			Date Julian day
	Start	Stop	Radial	Along track	Across track	
1992 8 14	2 2 15.5	2 2 18.5	0.29602061D-06	0.67719598D-05	0.27481830D-06	155650000301
1992 9 25	1 40 49.0	1 40 53.0	0.36000421D-06	0.83113257D-05	0.27448544D-06	156070000201
1992 9 25	2 31 8.0	2 31 10.0	0.24262201D-06	-0.57989875D-05	0.16718116D-06	156070000202
1992 10 22	2 42 43.0	2 42 47.0	0.31601280D-06	0.70285070D-05	0.50262647D-06	156340000201
1992 11 16	23 13 7.0	23 13 11.0	0.32808168D-06	0.76291381D-05	0.65820903D-06	156600000201
1992 12 4	2 29 28.0	2 29 30.0	0.39346659D-06	0.91854124D-05	0.64901782D-07	156770000201
1992 12 16	13 16 45.0	13 21 3.0	0.41808187D-06	0.10000000D-09	-0.97080262D-05	156890000301
1992 12 17	1 15 57.5	1 16 6.5	0.36695413D-06	0.93751711D-05	-0.28082831D-06	156900000201
1992 12 17	2 6 22.5	2 6 23.5	0.32519608D-06	0.82888417D-05	0.54045880D-06	156900000202
1993 1 5	2 3 6.0	2 3 8.0	0.35675641D-06	0.89142190D-05	0.71170546D-06	157090000201
1993 2 4	1 23 37.5	1 23 40.5	0.30918657D-06	0.78552336D-05	0.57465340D-06	157390000201
1993 3 9	0 51 34.0	0 51 38.0	0.30146044D-06	0.76486851D-05	0.43503155D-06	157720000201
1993 3 26	0 32 10.0	0 32 12.0	0.39218147D-06	0.89324640D-05	-0.57209152D-07	157890000201
1993 4 8	1 29 3.5	1 29 4.5	0.36081417D-06	0.82640032D-05	0.69413280D-06	158020000301
1993 4 20	0 32 15.0	0 32 17.0	0.25175937D-06	0.63698614D-05	0.35527719D-06	158140000201
1993 5 4	12 7 57.5	12 11 50.5	0.40643914D-06	0.10000000D-09	-0.94372416D-05	158280000201
1993 5 5	4 17 47.0	4 17 49.0	0.25563192D-06	0.65100442D-05	0.41642713D-06	1582900002201
1993 5 5	5 7 59.5	5 8 6.5	0.32988245D-06	0.84259602D-05	-0.27428650D-06	1582900002202
1993 6 4	1 37 54.0	1 37 56.0	0.40445729D-06	0.92772819D-05	0.77081640D-06	158590000201
1993 7 9	1 23 47.0	1 23 49.0	0.38398335D-06	0.86775145D-05	0.39639366D-06	158940000101
1993 8 27	2 13 44.0	2 13 46.0	0.32862801D-06	0.80655966D-05	0.19302751D-07	1594300002101
1993 9 10	0 43 9.5	0 43 10.5	0.19093934D-06	-0.43083228D-05	0.36659184D-07	159570000101
1993 10 8	1 56 20.0	1 56 22.0	0.33618494D-06	0.80624330D-05	0.11322135D-06	159850000101
1993 11 12	2 6 51.0	2 6 53.0	0.38827553D-06	0.86667821D-05	0.48877688D-06	160200000201
1993 12 10	0 57 15.0	0 57 17.0	0.22954741D-06	0.52520202D-05	0.42929500D-06	160480000201
1993 12 21	18 42 56.5	18 45 29.5	0.39460375D-06	0.10000000D-09	-0.91620870D-05	160600000201
1993 12 23	16 48 29.5	16 51 30.5	0.39367668D-06	-0.91403256D-05	0.10000000D-09	1606100002001
1993 12 23	17 38 52.5	17 41 47.5	0.38820674D-06	-0.90131112D-05	0.10000000D-09	1606100002002
1994 1 7	1 14 53.5	1 14 56.5	0.29530539D-06	0.72862641D-05	0.27032769D-06	160760000101
1994 1 7	2 5 7.0	2 5 9.0	0.27418559D-06	-0.61417761D-05	0.19465635D-06	160760000102
1994 2 1	0 37 49.0	0 37 51.0	0.22245575D-06	0.56079164D-05	0.26819257D-06	161010000101
1994 2 21	5 54 24.5	5 56 51.5	0.38119585D-06	0.10000000D-09	0.88500976D-05	161210000301
1994 2 21	19 0 43.5	19 0 44.5	0.35347369D-06	-0.86292137D-05	-0.10343690D-06	161220000201

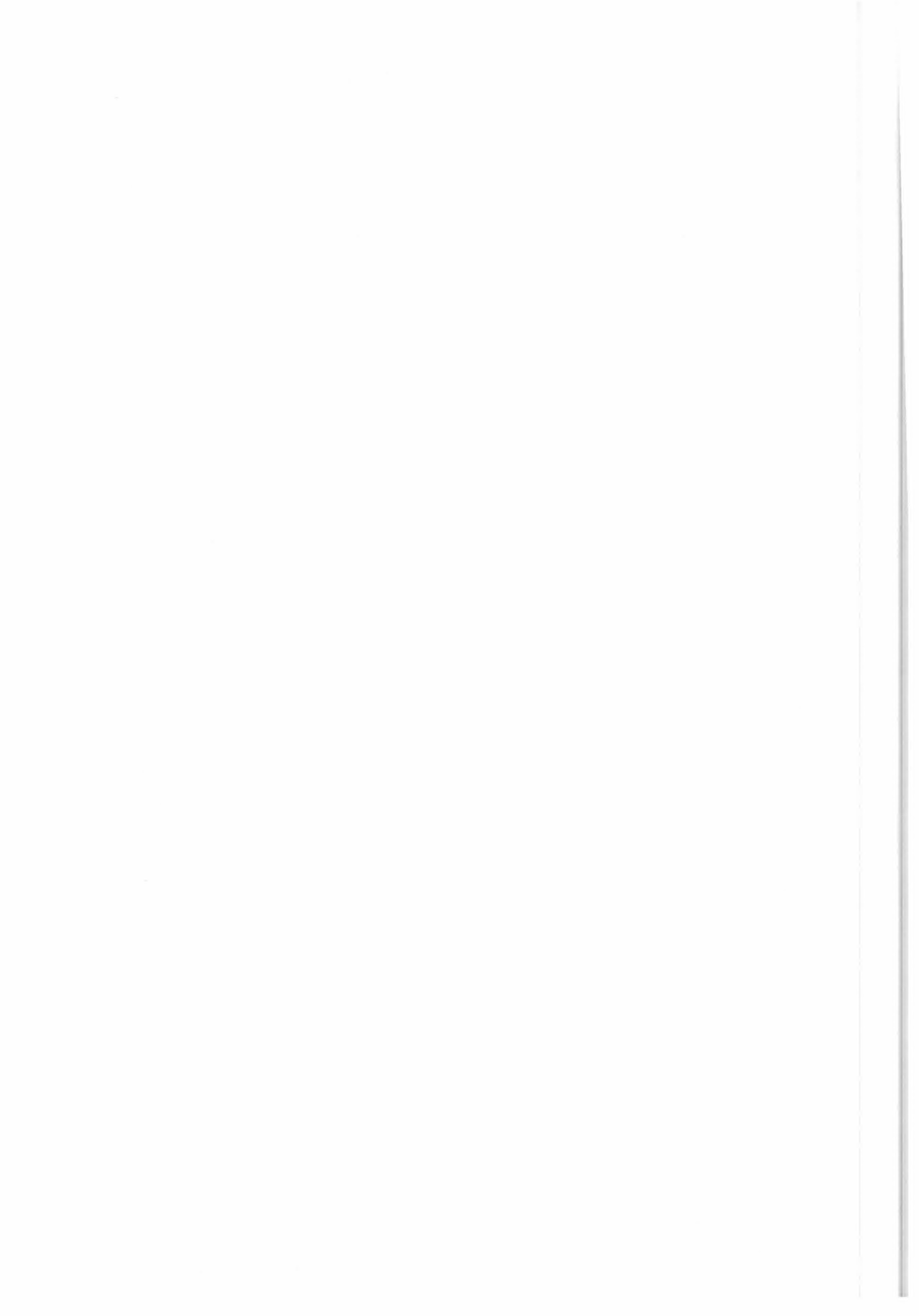




Table 3: ERS-1 Manoeuvres file

Date	Time		Acceleration (km/s/s)			Date Julian day
	Start	Stop	Radial	Along track	Across track	
1994 3 17	1 6 21.0	1 6 23.0	0.27299358D-06	0.69579334D-05	0.47578022D-06	161450000101
1994 4 8	12 52 21.5	12 56 2.5	0.37086197D-06	0.10000000D-09	0.86098978D-05	161670000201
1994 4 10	16 36 2.0	16 39 2.0	0.37102153D-06	-0.86133516D-05	0.10000000D-09	161700000201
1994 4 10	17 26 17.0	17 29 15.0	0.36659369D-06	-0.85103666D-05	0.10000000D-09	161700000202
1994 4 11	19 11 49.5	19 11 52.5	0.30931842D-06	-0.73434235D-05	0.18722639D-06	161710000101
1994 4 11	20 1 60.0	20 2 4.0	0.30255871D-06	0.71915869D-05	0.19749305D-07	161710000102
1994 5 17	0 58 28.5	0 58 31.5	0.30528161D-06	0.73796588D-05	0.61266829D-06	162060000101
1994 7 13	2 12 33.0	2 12 35.0	0.31817254D-06	0.73991442D-05	0.22475216D-06	162630000101
1994 9 15	1 6 36.0	1 6 38.0	0.23057295D-06	0.58549634D-05	-0.24353372D-06	163270000101
1994 9 27	0 33 5.0	0 33 23.0	0.38019549D-06	0.88612938D-05	-0.45593856D-06	163390000101
1994 9 27	1 21 45.0	1 22 3.0	0.38402048D-06	0.88290731D-05	0.73379137D-06	163390000102
1994 9 28	9 14 49.5	9 15 6.5	0.39897569D-06	-0.90553410D-05	-0.47565231D-06	163400000301
1994 9 28	10 4 55.0	10 5 13.0	0.38192709D-06	-0.86569439D-05	0.71626983D-06	163400000302
1994 11 15	0 43 13.0	0 43 15.0	0.39713990D-06	0.91841058D-05	0.28503342D-06	163880000101
1994 12 16	0 25 44.0	0 30 18.0	0.38483622D-06	0.10000000D-09	-0.91534035D-05	164190000201
1994 12 16	23 41 18.5	23 41 25.5	0.32694916D-06	-0.80676622D-05	0.57725688D-06	164200000201
1994 12 17	0 31 34.5	0 31 37.5	0.36330402D-06	0.81097035D-05	0.60436364D-06	164200000202
1995 1 20	1 9 2.0	1 9 4.0	0.25623214D-06	0.62444332D-05	0.16749885D-06	164540000101
1995 3 3	1 19 36.5	1 19 37.5	0.35421374D-06	0.88961586D-05	0.68896837D-06	164960000101
1995 3 19	10 7 55.5	10 15 56.5	0.37913289D-06	0.10000000D-09	0.90169474D-05	165120000201
1995 3 19	11 48 6.0	11 56 26.0	0.36478697D-06	0.10000000D-09	0.86748357D-05	165120000202
1995 3 21	5 43 47.5	5 50 12.5	0.35265537D-06	0.83856433D-05	0.10000000D-09	165140000301
1995 3 21	8 14 25.0	8 20 51.0	0.34490313D-06	0.82007502D-05	0.10000000D-09	165140000302
1995 3 24	1 19 18.0	1 19 28.0	0.33911273D-06	0.75703220D-05	-0.18813681D-06	165170002101
1995 3 24	2 9 40.0	2 9 46.0	0.30834516D-06	-0.76373171D-05	-0.19261162D-06	165170002102
1995 5 10	1 13 21.5	1 13 24.5	0.29350661D-06	0.72839129D-05	0.57208130D-06	165640000101
1995 5 10	2 3 35.5	2 3 36.5	0.34698712D-06	-0.76962858D-05	0.61388543D-06	165640000102
1995 6 30	0 54 28.0	0 54 30.0	0.29240837D-06	0.65056082D-05	0.44302798D-06	166150000101
1995 9 5	7 40 35.0	7 42 23.0	0.33847221D-06	0.10000000D-09	0.80474021D-05	166820000201
1995 9 6	0 58 10.0	0 58 12.0	0.21534071D-06	0.49025480D-05	-0.42392298D-07	166830000201
1995 9 6	1 48 29.0	1 48 31.0	0.32869500D-06	0.74777502D-05	0.26986121D-06	166830000202
1995 10 6	1 6 58.5	1 6 59.5	0.18311254D-06	0.41246112D-05	0.15632803D-06	167130000101
1995 11 15	6 18 20.0	6 20 38.0	0.33033799D-06	0.10000000D-09	-0.78537357D-05	167530000201

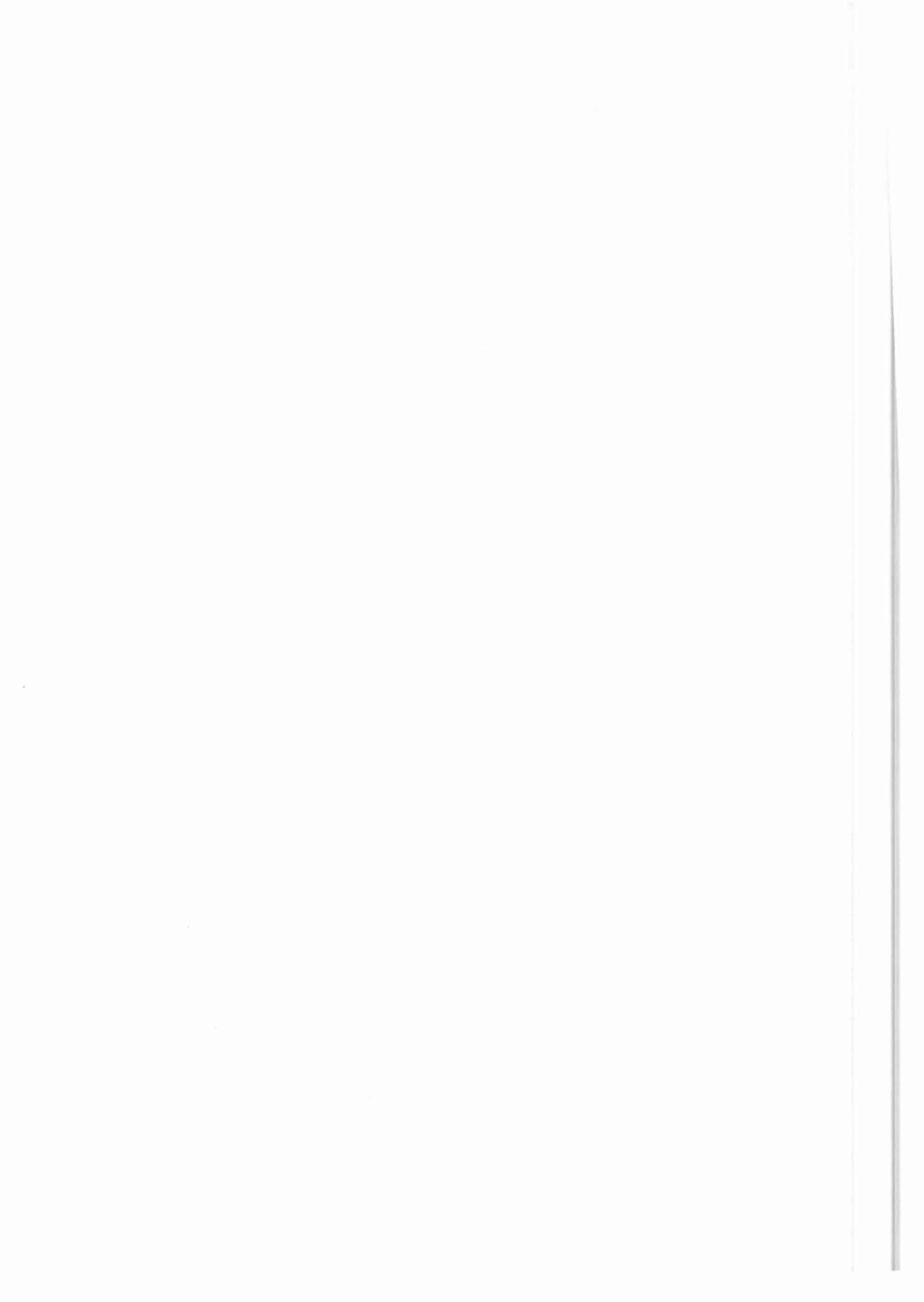
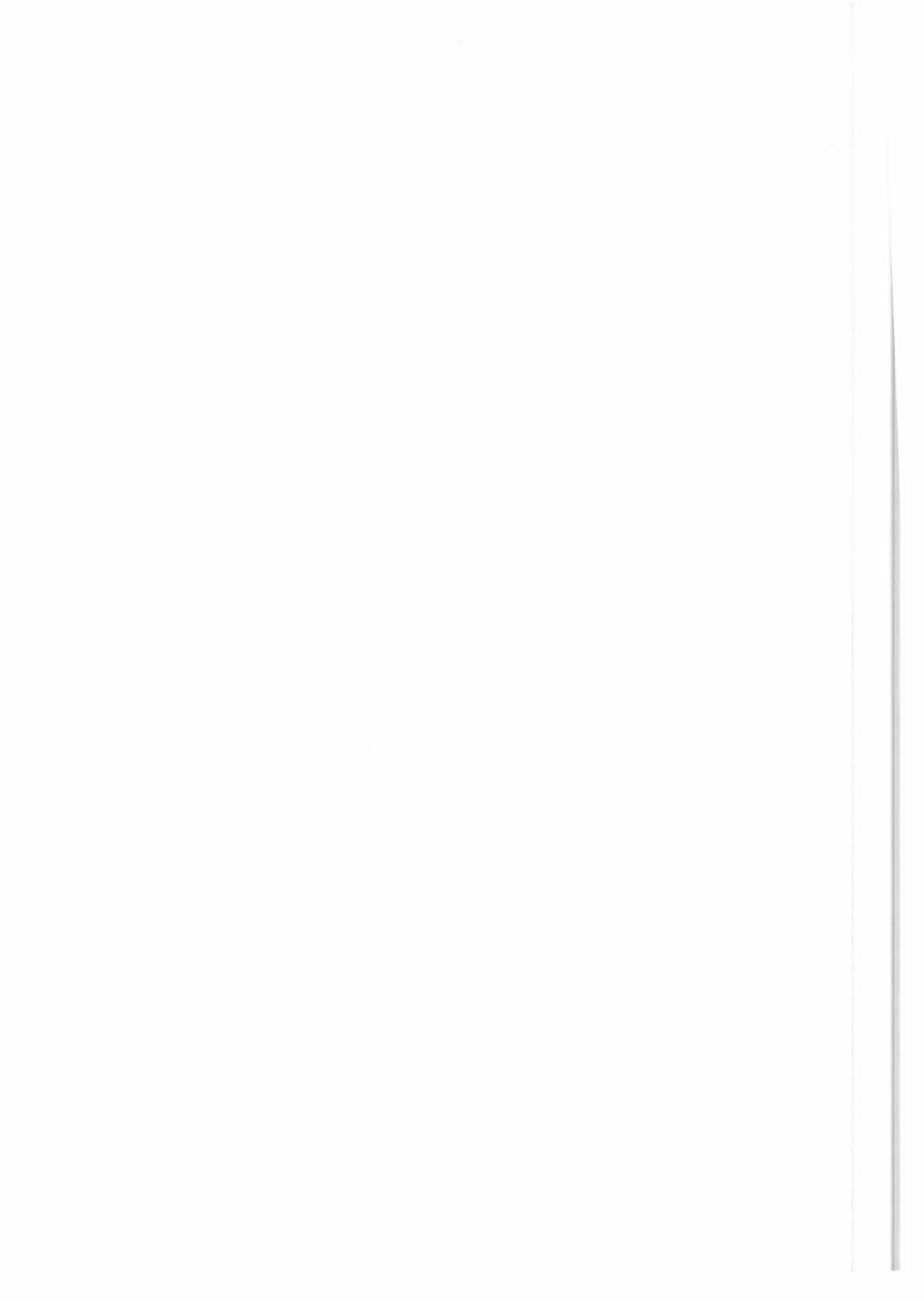




Table 3: ERS-1 Manoeuvres file

Date	Time		Acceleration (km/s/s)			Date Julian day
	Start	Stop	Radial	Along track	Across track	
1995 11 15	19 33 14.0	19 33 18.0	0.31729902D-06	-0.78641841D-05	0.52173056D-06	167540000201
1995 11 22	4 55 26.0	4 55 28.0	0.33924730D-06	0.75378308D-05	0.43746386D-06	167600000101
1995 12 22	2 13 11.5	2 13 12.5	0.50147091D-07	-0.11042132D-05	0.40428279D-07	167900000101





4 : ERS-2 Manoeuvres

The following table 4 gives the complete list of ERS-2 manoeuvres since launch. They include all OCM and FPM manoeuvres up to December 1995.

Table 4: ERS-2 Manoeuvres file

Date	Time		Acceleration (km/s/s)			Date Julian day
	Start	Stop	Radial	Along track	Across track	
1995 4 22	2 48 6.5	2 51 53.5	0.36508580D-06	-0.10145763D-04	0.10000000D-09	165460001001
1995 4 22	15 18 4.5	15 21 55.5	0.35766070D-06	-0.99391076D-05	0.10000000D-09	165470000301
1995 4 25	2 57 8.0	2 57 54.0	0.34734739D-06	0.10000000D-09	0.96522920D-05	165490000301
1995 4 27	6 50 35.0	6 55 25.0	0.37167376D-06	0.10106242D-04	0.10000000D-09	165510000901
1995 4 27	7 39 9.0	7 42 43.0	0.36086140D-06	0.98121072D-05	0.10000000D-09	165510000902
1995 4 28	6 13 57.0	6 13 59.0	0.29740849D-06	-0.85949162D-05	-0.46281732D-06	165520000401
1995 4 28	7 4 11.0	7 4 13.0	0.19439618D-06	-0.56098301D-05	0.42993274D-06	165520000402
1995 5 11	23 19 18.0	23 19 20.0	0.20247865D-06	0.55741373D-05	0.94733446D-07	165660000201
1995 5 12	0 9 35.5	0 9 36.5	0.14286017D-06	0.39339157D-05	-0.59170619D-08	165660000202
1995 6 29	22 7 26.0	22 7 28.0	0.25682113D-06	0.65382550D-05	0.50420925D-06	166150000201
1995 7 4	1 57 30.5	1 57 31.5	0.46060417D-07	-0.13186161D-05	0.92663796D-07	166190000101
1995 9 6	7 40 47.0	7 42 17.0	0.35473161D-06	0.10000000D-09	0.96453353D-05	166830003101
1995 9 6	23 24 16.5	23 24 17.5	0.33192048D-06	0.83609851D-05	-0.28308061D-06	166840000301
1995 9 7	0 14 36.5	0 14 39.5	0.31469926D-06	0.79209710D-05	0.48972834D-06	166840000302
1995 11 14	5 41 12.0	5 43 6.0	0.34128682D-06	0.10000000D-09	-0.94828636D-05	167520000201
1995 11 15	1 5 26.5	1 5 27.5	0.24151630D-06	0.69334469D-05	0.54625442D-06	167530000201
1995 11 15	1 55 37.5	1 55 44.5	0.28544458D-06	0.82080758D-05	-0.40870138D-06	167530000202
1995 12 8	1 2 37.5	1 2 38.5	0.47069268D-07	0.12627634D-05	-0.18226818D-08	167760000101

