Chapter 2 - Orbit Overview

Contents

Introduction to Chapter 2

This chapter gives an overview of the NIMS observations in the C20 Orbit.

The text on page 3 summarizes the NIMS science objectives for C20. The NIMS calibrations are discussed on page 3. Early data return and C20 playback are also discussed on page 3.

The table on page 4 is a time-ordered listing of the NIMS Oapels for C20.

The plot on page 5 shows the geometry of the NIMS C20 observations using a north trajectory pole view projection. The plot on page 6 shows the geometry of the NIMS C20 calibrations.

The spreadsheet on page 7 summarizes the various inputs for the NIMS C20 Observations. The spreadsheet on pages 8 and 9 summarizes the resource usage for the NIMS C20 observations.

The table on page 10 lists various NIMS C20 observing parameters: target latitude/longitude, range, cone angle, incidence angle light), emission angle view) and phase angle.

The timeline on page 11 shows the placement of the C20 observations for all intruments during the C20 Encounter Period.

The tapemap on page 12 shows the placement of the C20 observations on the spacecraft’s tape recorder.

The timeline on pages 13 through 21 shows the preliminary C20 playback schedule.

The NIMS C20 mosaic designs are summarized on page 22 and 23 in time-order.

NIMS C20 SCIENCE OVERVIEW

Jupiter Science

There are eight Jupiter observations in C20. Three are realtime and five are recorded. The first and third realtime observations look at the Northern Temperate Belt (NTB) and the second looks at the southern auroal region. Two recorded observations (JNHOTMAP01 and 02) map the same +7 degree latitude hotspot region at different viewing geometries, 1 nightside and 1 dayside. Three other observations (JNGRWAKE01, 02 and 03) map the same turbulent wake region downstream of the Great Red Spot at different viewing geometries, 1 nightside and 2 dayside.

Io Science

INHRSPEC01 maps the 1/3 daylit disk. This observation has the best nightside coverage of the Prometheus Hemisphere to date.

Europa Science

There is a single distant Europa eclipse observation in C20.

Ganymede Science

Ganymede was not observed in C20.

Callisto Science

There are six observations of Callisto in C20. CNCATMOS01 is a near-equatorial limbscan to look for carbon dixide molecules and other constituents in Callisto's tenuous atmosphere. CNFEATRE01, 02 and 03 are regional maps to determine minor surface constiuents on the trailing hemisphere of Callisto. CNBRANCR01 maps the region surrounding the Bran crater. CNGLOBAL01 is a global map of the daylit-disk in three swaths, from 180 to 280 degrees West longitude.

Calibration

There are five NIMS calibration observations planned for C20: one PCT cal, one RCT cal, three OPCALs. OPCAL_02 and 03 are tacked on to the end of recorded observations.

Early Data Return

There are six realtime observations in C20: Three 408 wavelength Jupiter observations (JUPRTS), one PCT calibration, one RCT calibration and one OPCAL.

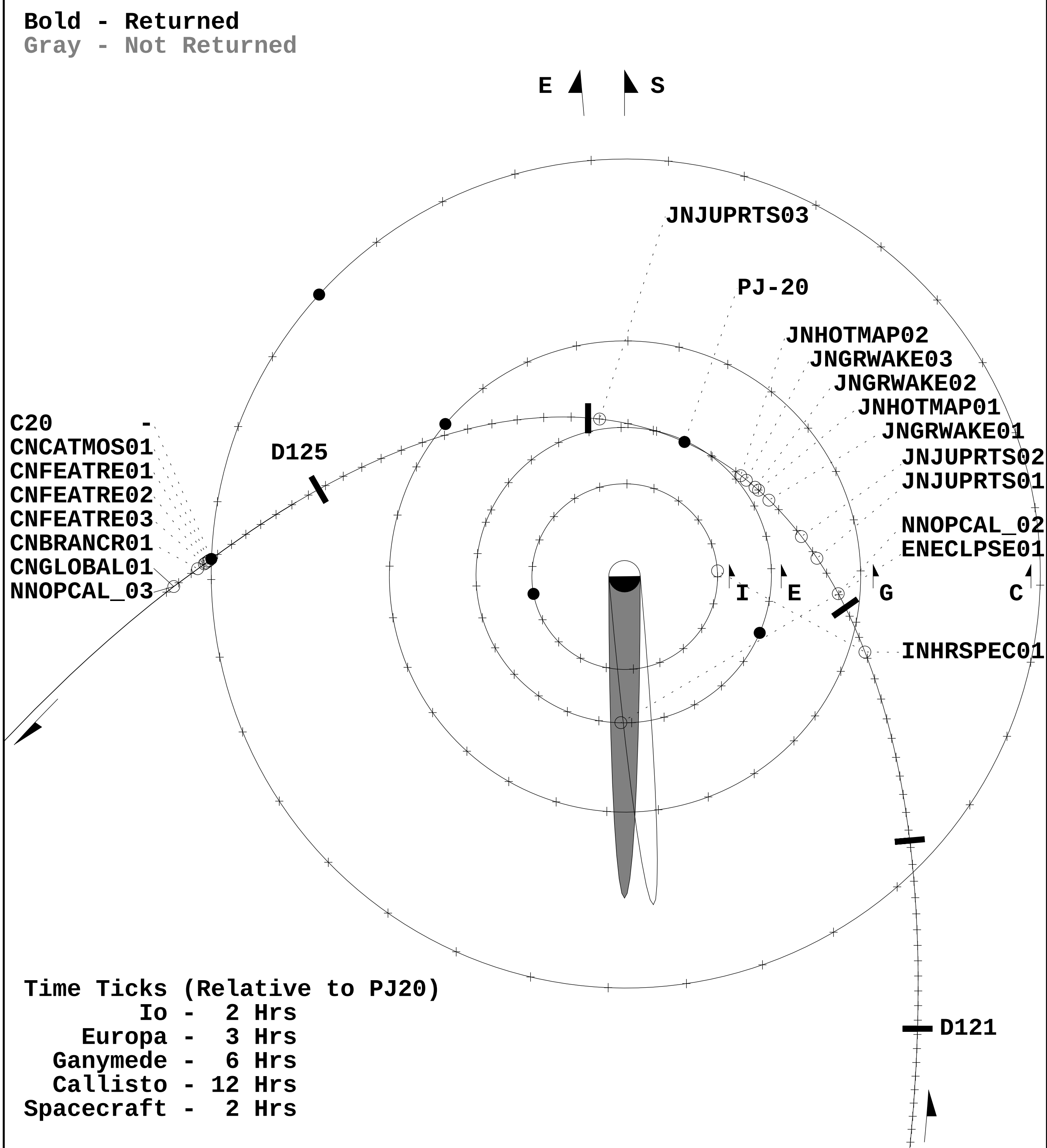
C20 Playback

C20 playback is split into two passes through the tape.

C20 Time-Ordered Listing

OAPEL	Start (UTC)	End (UTC)	Duration
20NNHRSPEC01-	99-122/19:49:38	99-122/19:51:40	000/00:02:01
20INHRSPEC01*	99-122/19:52:40	99-122/19:59:45	000/00:07:04
20NNECLPSE01-	99-123/01:08:08	99-123/01:10:10	000/00:02:01
20ENECLPSE01*	99-123/01:11:10	99-123/01:18:15	000/00:07:04
20NNJUPRTS01-	99-123/04:28:20	99-123/04:30:22	000/00:02:01
20JNJUPRTS01*	99-123/04:31:22	99-123/04:45:32	000/00:14:09
20NNJUPRTS02-	99-123/06:30:41	99-123/06:32:42	000/00:02:01
20JNJUPRTS02*	99-123/06:33:43	99-123/06:47:52	000/00:14:09
20NNGRWAKE01-	99-123/09:56:57	99-123/09:58:58	000/00:02:01
20JNGRWAKE01-	99-123/09:58:58	99-123/10:19:12	000/00:20:13
20NNHOTMAP01-	99-123/10:57:37	99-123/10:59:38	000/00:02:01
20JNHOTMAP01-	99-123/11:00:39	99-123/11:19:52	000/00:19:12
20JNGRWAKE02-	99-123/11:19:52	99-123/11:39:04	000/00:19:12
20NNGRWAKE03-	99-123/11:54:14	99-123/11:57:16	000/00:03:02
20JNGRWAKE03-	99-123/11:57:16	99-123/12:12:26	000/00:15:10
20NNHOTMAP02-	99-123/12:30:38	99-123/12:33:40	000/00:03:02
20JNHOTMAP02-	99-123/12:35:42	99-123/12:54:54	000/00:19:12
20NNJUPRTS03-	99-123/22:57:32	99-123/22:59:33	000/00:02:01
20JNJUPRTS03*	99-123/23:00:34	99-123/23:14:43	000/00:14:09
20NNCATMOS01-	99-125/14:21:30	99-125/14:23:32	000/00:02:01
20CNCATMOS01-	99-125/14:24:32	99-125/14:37:41	000/00:13:08
20CNFEATRE01-	99-125/14:37:41	99-125/14:48:48	000/00:11:07
20NNFEATRE02-	99-125/14:51:50	99-125/14:53:52	000/00:02:01
20CNFEATRE02-	99-125/14:54:52	99-125/15:09:02	000/00:14:09
20NNFEATRE03-	99-125/15:27:14	99-125/15:29:15	000/00:02:01
20CNFEATRE03-	99-125/15:29:15	99-125/15:43:24	000/00:14:09
20NNBRANCR01-	99-125/15:59:35	99-125/16:01:36	000/00:02:01
20CNBRANCR01-	99-125/16:02:37	99-125/17:03:17	000/01:00:40
20NNGLOBAL02-	99-125/19:47:05	99-125/19:49:06	000/00:02:01
20CNGLOBAL01-	99-125/19:50:07	99-125/20:22:28	000/00:32:21
20NNCHOPOF01-	99-125/20:38:39	99-125/20:48:46	000/00:10:06
20NNPCTRLT01-	99-138/18:29:56	99-139/02:20:06	000/07:50:10
20NNRCTRLT01-	99-157/12:00:00	99-158/01:15:44	000/13:15:44

NIMS C20 OBSERVATIONS



Callisto Flyby (C20): 05-MAY-1999 (D125) 14:07:24 UTC
Perijove (PJ20): 03-MAY-1999 (D123) 17:12:24 UTC

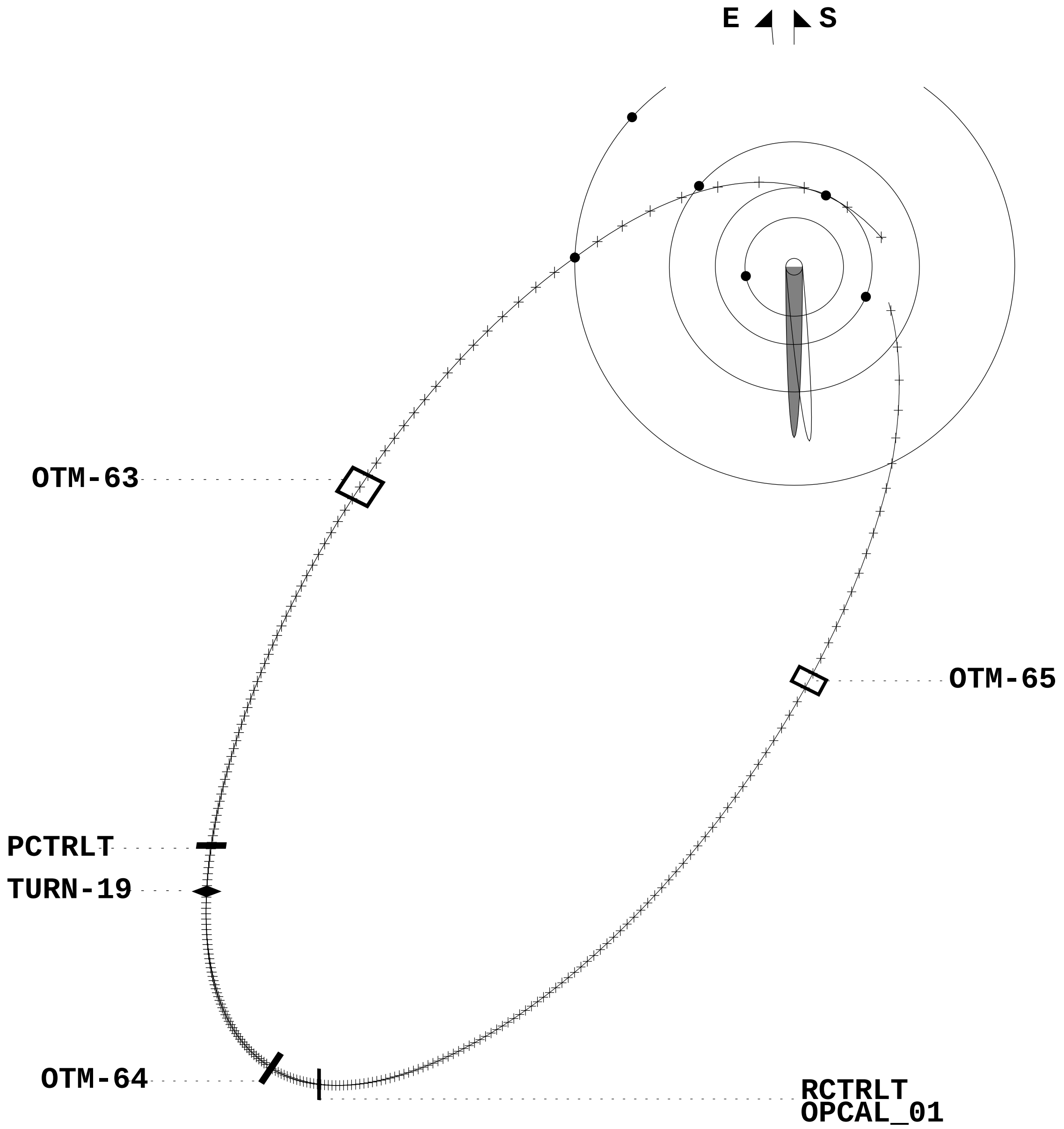
C20 North Trajectory Pole View

NIMS - FEL - 12/06/99

NIMS C20 CRUISE CALIBRATIONS

Callisto Flyby (C20): 05-MAY-1999 (D125) 14:07:24 UTC
Perijove (PJ20): 03-MAY-1999 (D123) 17:12:24 UTC
Apojove (AJ20): 02-JUN-1999 (D153) 16:00:00 UTC

Time Ticks (Relative to C20)
Spacecraft - 6 Hours



C20 North Trajectory Pole View, Perijove to Perijove

C20 NIMS INPUTS

Activity ID	Observation Title	NIMS Edit Table	NIMS PB Table	Mode	Gain	Grating Start	Grating Offset	Record Format	PSID
20NNHRSPEC01-	NIMS Software Reload								
20INHRSPEC01*	Io Monitoring at High Spectral Resolution	C20ILMDK243D	C20ILMDK228D	LM	4	0	4	LPU	DA
20NNECLPSE01-	NIMS Software Reload								
20ENECLPSE01*	Europa Eclipse Obs	C20ELM442	C20ELM360	LM	4	0	4	MPW	DB
20ENECLPSE01-	Europa Eclipse Obs(O)	C20PCT252	C20OPCAL48	LM	4	0	4	MPW	EB
20NNJUPRTS01-	NIMS Software Reload								
20JNJUPRTS01*	Jupiter Realtime Observation	C20JLM442/MB	R/T	LM	2	0	4	R/T	DH
20NNJUPRTS02-	NIMS Software Reload								
20JNJUPRTS02*	Jupiter Realtime Observation	C20JRT204A/MB	R/T	LM	2	0	4	R/T	DI
20NNGRWAKE01-	NIMS Software Reload								
20JNGRWAKE01-	GRWAKE01	C20JHT253A	C20JHT100A	LM	4	0	4	LPU	DC
20NNHOTMAP01-	NIMS Software Reload								
20JNHOTMAP01-	NIMS Jupiter HotMap	C20JHT253A	C20JHT100A	LM	4	0	4	LPU	DD
20JNGRWAKE02-	GRWAKE02	C20JSB253C	C20JSB140C	LM	2	0	4	LPU	DE
20NNGRWAKE03-	NIMS Software Reload								
20JNGRWAKE03-	GRWAKE03	C20JSB253C	C20JSB140C	LM	2	0	4	LPU	DF
20NNHOTMAP02-	NIMS Software Reload								
20JNHOTMAP02-	NIMS Jupiter HotMap	C20JSB253C	C20JSB140C	LM	2	0	4	LPU	DG
20NNJUPRTS03-	NIMS Software Reload								
20JNJUPRTS03*	Jupiter Realtime Observation	C20JLM442/MB	R/T	LM	2	0	4	R/T	DJ
20NNATMOS01-	NIMS Software Reload								
20CNCATMOS01-	Callisto Limb Scan	C20CLM247L	C20CLM228L	LM	4	0	4	LPU	DL
20CNFEATRE01-	Callisto Feature	C20CLM442	C20CLM228D_1	LM	4	0	4	MPW	DK
20NNFEATRE02-	NIMS Software Reload								
20CNFEATRE02-	Callisto Feature	C20CLM442	C20CLM228D_1	LM	4	0	4	MPW	DM
20NNFEATRE03-	NIMS Software Reload								
20CNFEATRE03-	Callisto Feature Observation	C20CLM442	C20CLM228D_1	LM	4	0	4	MPW	DN
20NNBRANCR01-	NIMS Software Reload								
20CNBRANCR01-	Bran Crater	C20CLM442	C20CLM228D_1	LM	4	0	4	MPW	DP
20NNGLOBAL02-	NIMS Software Reload								
20CNGLOBAL01-	Callisto Global Map	C20CLM243D	C20CLM228D_0	LM	4	0	4	LPU	DO
20CNGLOBAL01-	Callisto Global Map(O)	C20PCT252	C20OPCAL48	LM	4	0	4	LPU	FB
20NNPCTRLT01-	NIMS Real-Time PCT Calibration	C20PCT252	R/T	LM	4	0	4	R/T	FB
20NNRCTRLT01-	NIMS RCT Real Time Calibration	C20RCT252	R/T	LM	1	0	4	R/T	XE
20NNROPCAL01	NIMS OPCAL	C20OPCAL48	R/T	LM	4	0	4	R/T	DC

C20 RESOURCES

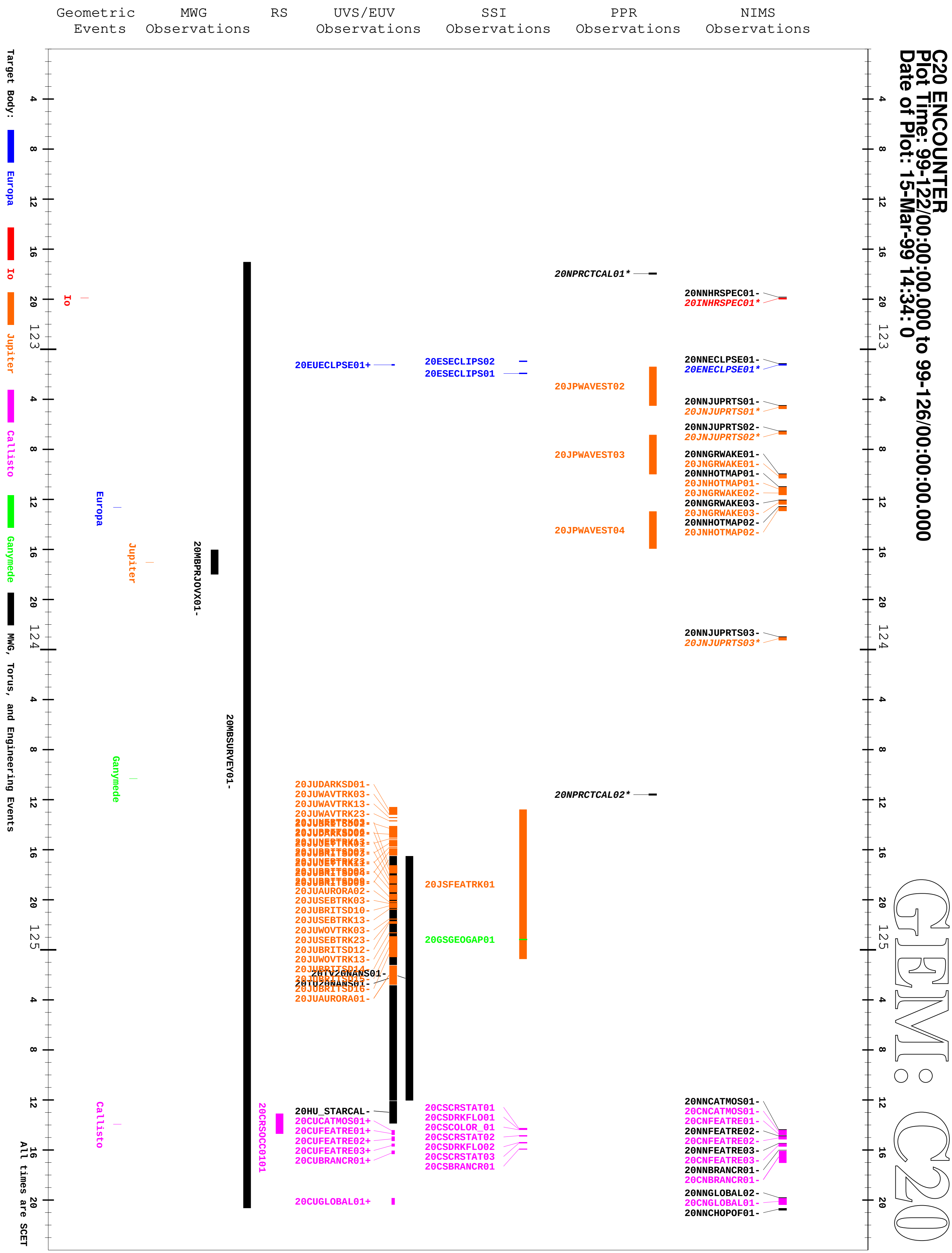
Activity ID	Mode	Record Format	Obs. Cost (tracks)	Obs. Cost (ticks)	Number Wavelengths Returned	Obs Record (sec.)	Obs PB (sec.)	Selected Bits to Tape sBOT (MBITS)	Bits to Tape MBOT (Mbit)	Mode Cycle time (sec)
20INHRSPEC01	LM	LPU	0.0100	58	228	240	180	1.11	1.48	8.667
20ENECLPSE01	LM	MPW	0.0457	266	360	300	182	2.10	3.46	8.667
20ENECLPSE01_O	LM	MPW	0.0185	108	48	120	61	0.70	1.38	8.667
20JNJUPRTS01	LM	R/T			360					
20JNJUPRTS02	LM	R/T			204					
20JNGRWAKE01	LM	LPU	0.0239	139	100	585	585	3.61	3.61	8.667
20JNHOTMAP01	LM	LPU	0.0359	209	100	885	423	2.61	5.46	8.667
20JNGRWAKE02	LM	LPU	0.0239	139	140	585	585	3.61	3.61	8.667
20JNGRWAKE03	LM	LPU	0.0239	139	140	585	585	3.61	3.61	8.667
20JNHOTMAP02	LM	LPU	0.0359	209	140	885	423	2.61	5.46	8.667
20JNJUPRTS03	LM	R/T			360					
20CNCATMOS01	LM	LPU	0.0245	143	228	600	600	3.70	3.70	8.667
20CNFEATRE01	LM	MPW	0.0909	530	228	600	548	6.31	6.91	8.667
20CNFEATRE02	LM	MPW	0.1666	971	228	1102	1092	12.58	12.70	8.667
20CNFEATRE03	LM	MPW	0.0909	530	228	600	595	6.85	6.91	8.667
20CNBRANCR01	LM	MPW	0.1240	722	228	819	747	8.61	9.43	8.667
20CNGLOBAL01	LM	LPU	0.0687	400	228	1700	1379	8.51	10.49	8.667
20CNGLOBAL01_O	LM	LPU	0.0052	30	48	120	120	0.74	0.74	8.667
Total			**0.7786**	**4537**						
Allocated										

C20 RESOURCES

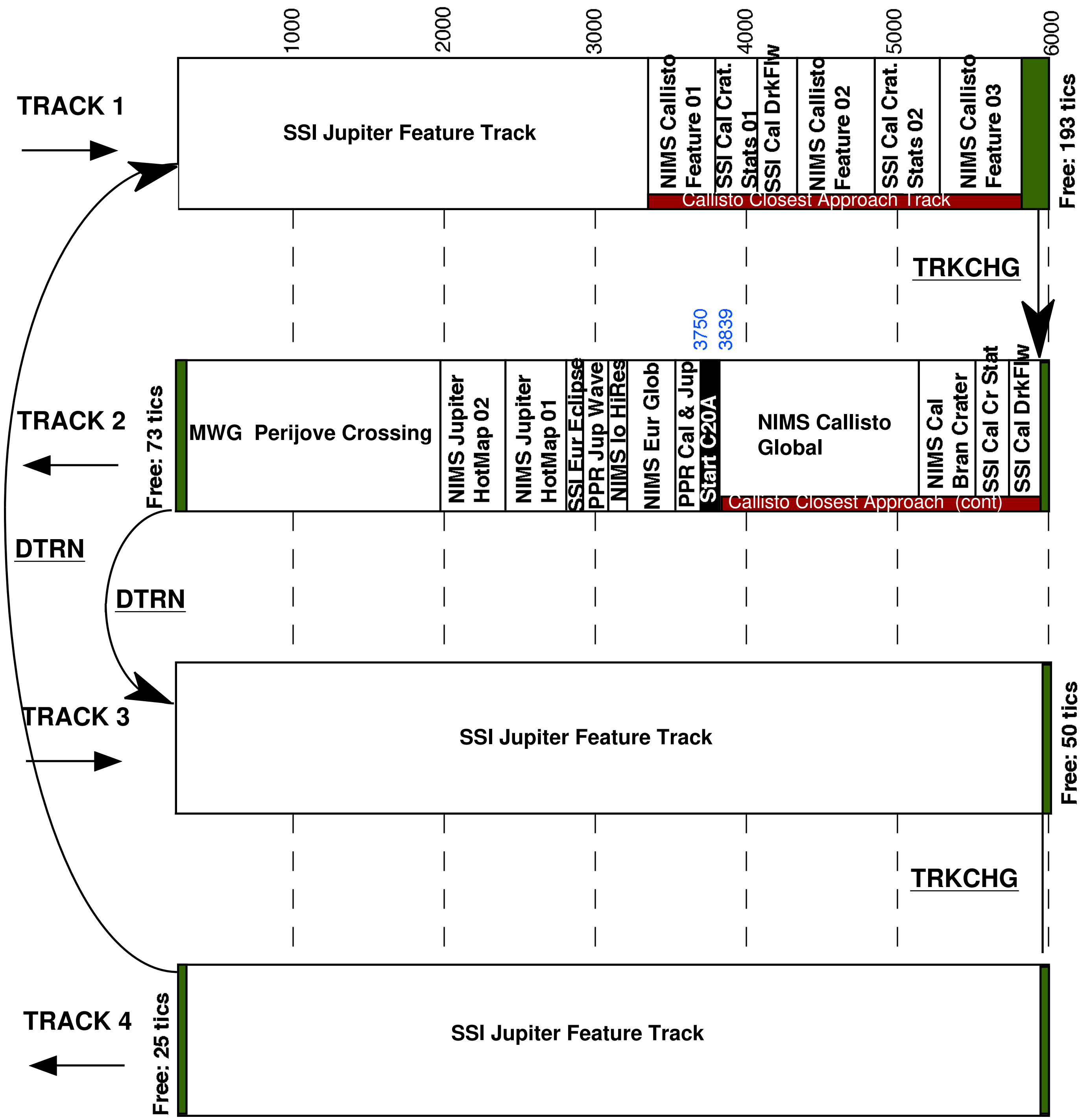
Activity ID	AACS Mbits c 2.5	Comp	RT BTG MBits	Total BTG Mbits (4% ohead)	Data Reduction Factor (sBOT/BTG)	Pass
20INHRSPEC01	0.01	1.20		0.8208	1.4	1
20ENECLPSE01	0.01	1.60		0.9828	2.1	2
20ENECLPSE01_O	0.00	1.60		0.0439	16.0	1
20JNJUPRTS01			0.16			
20JNJUPRTS02			0.16			
20JNGRWAKE01	0.03	1.30		1.0800	3.3	2
20JNHOTMAP01	0.02	1.30		0.7809	3.3	1
20JNGRWAKE02	0.03	1.60		1.2285	2.9	2
20JNGRWAKE03	0.03	1.60		1.2285	2.9	1
20JNHOTMAP02	0.02	1.60		0.8883	2.9	2
20JNJUPRTS03			0.16			
20CNCATMOS01	0.03	1.90		1.7279	2.1	2
20CNFEATRE01	0.03	1.90		1.5782	4.0	1
20CNFEATRE02	0.06	1.90		3.1448	4.0	1
20CNFEATRE03	0.03	1.90		1.7135	4.0	1
20CNBRANCR01	0.04	1.90		2.1513	4.0	2
20CNGLOBAL01	0.08	2.00		3.7728	2.3	1,2
20CNGLOBAL01_O	0.01	2.00		0.0691	10.7	1
Total				**21.2112**		
Allocated				**22.0180**		

NIMS C20 OBSERVING GEOMETRY

OAPEL	Latitude (deg)	Longitude (deg)	Range (km)	Cone (deg)	Light (deg)	View (deg)	Phase (deg)
20INHRSPEC01	-90 to +90	156 to 287	780K	54	55 to 172	1 to 63	121
20ENECLPSE01	-90 to +90	340 to 149	1145K	116	13 to 149	7 to 90	59
20JNJUPRTS01	0 to +7	22 to 46	804K	90	56 to 85	1 to 29	84
20JNJUPRTS02	-80 to -70	77 to 185	808K	99	81 to 101	82 to 91	75
20JNGRWAKE01	-20 to -12	254 to 276	690K	118	90 to 116	35 to 62	58
20JNHOTMAP01	+4 to +12	299 to 324	690K	123	96 to 126	45 to 77	51
20JNGRWAKE02	-20 to -12	257 to 269	649K	120	46 to 64	17 to 21	55
20JNGRWAKE03	-20 to -12	243 to 261	654K	121	23 to 38	32 to 51	55
20JNHOTMAP02	+4 to +12	308 to 321	629K	128	49 to 63	9 to 21	47
20JNJUPRTS03	-7 to +0	288 to 300	668K	170	14 to 29	24 to 41	13
20CNCATMOS01	+5 to + 6	252 to 268	18K	89	3 to 15	81 to 94	96
20CNFEATRE01	-5 to +5	210 to 216	22K	98	53 to 58	27 to 34	86
20CNFEATRE02	+25 to +35	189 to 225	34K	102	49 to 78	28 to 50	81
20CNFEATRE03	+5 to +15	192 to 215	50K	105	54 to 76	9 to 28	79
20CNBRANCR01	-45 to -12	192 to 215	68K	107	61 to 79	20 to 38	78
20CNGLOBAL01	-90 to +90	178 to 288	1880K	108	0 to 94	2 to 90	75

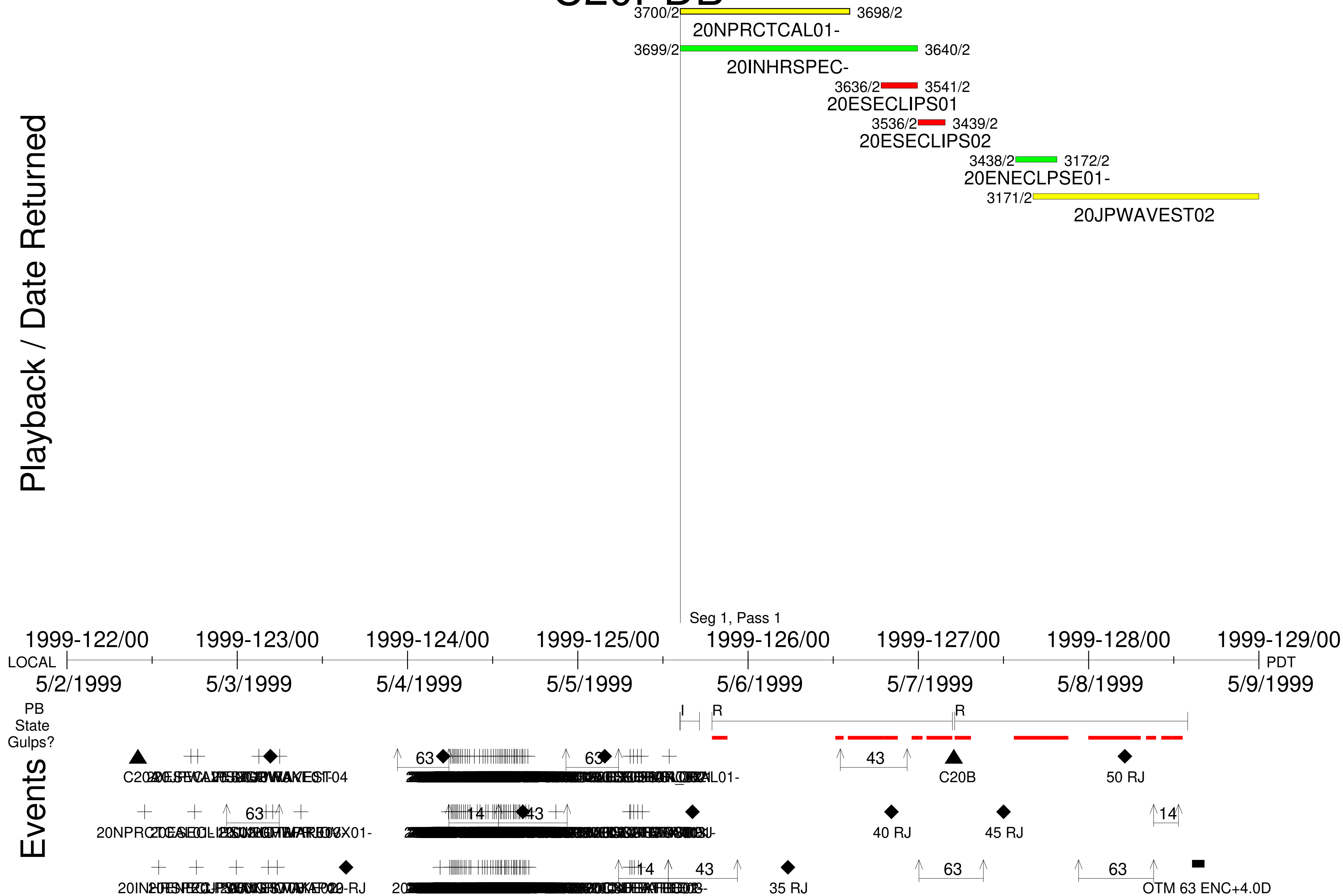

C20 ENCOUNTER
Plot Time: 99-122/00:00:00.000 to 99-126/00:00:00.000
Date of Plot: 15-Mar-99 14:34: 0
Geometric Events
MWG Observations
RS
UVS/EUV Observations
SSI Observations
PPR Observations
NIMS Observations
Target Body:
Europa
Io
Jupiter
Callisto
Ganymede
MWG, Torus, and Engineering Events
All times are SCET
123
124
125
20MBSURVEY01-
20MBPRJOVX01-
20CRSOCC0101
20EUECLPSE01+
20ESECLIPS02
20ESECLIPS01
20JPWAVEST02
20JPWAVEST03
20JPWAVEST04
20NPRCTCAL01*
20NPRCTCAL02*
20NNHRSPEC01-
20INHRSPEC01*
20NNECLPSE01-
20ENECLPSE01*
20NNJUPRTS01-
20JNJUPRTS01*
20NNJUPRTS02-
20JNJUPRTS02*
20NNGRWAKE01-
20JNGRWAKE01-
20NNHOTMAP01-
20JNHOTMAP01-
20JNGRWAKE02-
20NNGRWAKE03-
20JNGRWAKE03-
20NNHOTMAP02-
20JNHOTMAP02-
20NNJUPRTS03-
20JNJUPRTS03*
20JUDARKSD01-
20JUWAVTRK03-
20JUWAVTRK13-
20JUWAVTRK23-
20JUAURORA02-
20JUSEBTRK03-
20JUBRITSD10-
20JUSEBTRK13-
20JUWOVTRK03-
20JUSEBTRK23-
20JUBRITSD12-
20JUWOVTRK13-
20JUBRITSD16-
20JUAURORA01-
20TV2ONANS01-
20JSFEATRK01
20GSGEOGAP01
20HU_STARCAL-
20CUCATMOS01+
20CUFEATRE01+
20CUFEATRE02+
20CUFEATRE03+
20CUBRANCR01+
20CUGLOBAL01+
20CSCRSTAT01
20CSDRKFLO01
20CSCOLOR_01
20CSCRSTAT02
20CSDRKFLO02
20CSCRSTAT03
20CSBRANCR01
20NNCATMOS01-
20CNCATMOS01-
20CNFEATRE01-
20NNFEATRE02-
20CNFEATRE02-
20NNFEATRE03-
20CNFEATRE03-
20NNBRANCR01-
20CNBRANCR01-
20NNGLOBAL02-
20CNGLOBAL01-
20NNCHOPOF01-
GEM: C20

C20 HIGH-LEVEL TAPEMAP



J. Gross, 8/13/97

C20PDB



Playback / Date Returned
3700/2
3698/2
20NPRCTCAL01-
3699/2
3640/2
20INHRSPEC-
3636/2
3541/2
20ESECLIPS01
3536/2
3439/2
20ESECLIPS02
3438/2
3172/2
20ENECLPSE01-
3171/2
20JPWAVEST02
Seg 1, Pass 1
1999-122/00
1999-123/00
1999-124/00
1999-125/00
1999-126/00
1999-127/00
1999-128/00
1999-129/00
LOCAL
PDT
5/2/1999
5/3/1999
5/4/1999
5/5/1999
5/6/1999
5/7/1999
5/8/1999
5/9/1999
PB
State
Gulps?
I
R
R
Events
63
63
43
C20B
50 RJ
14
43
40 RJ
45 RJ
14
63
14
43
35 RJ
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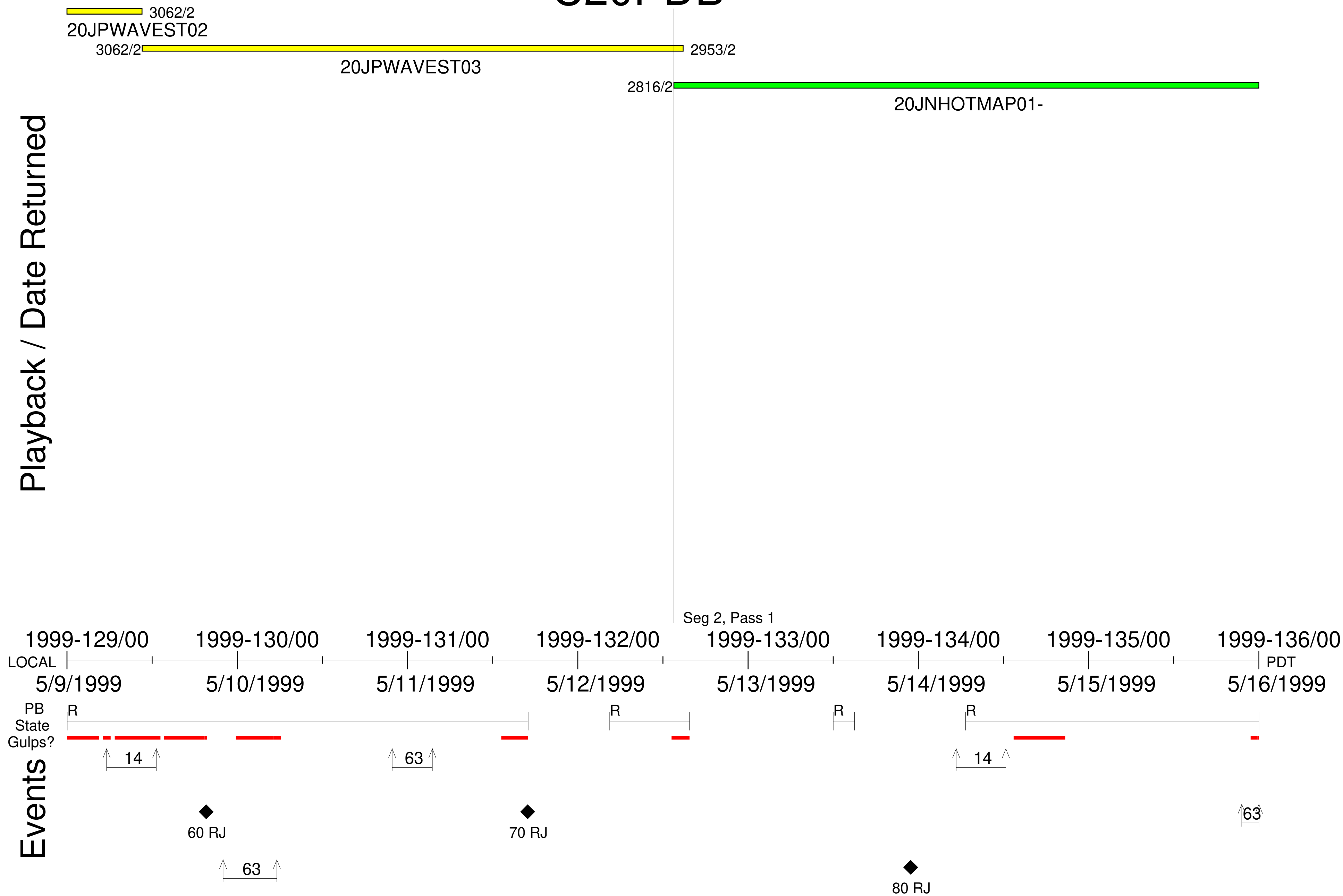
C20PDB



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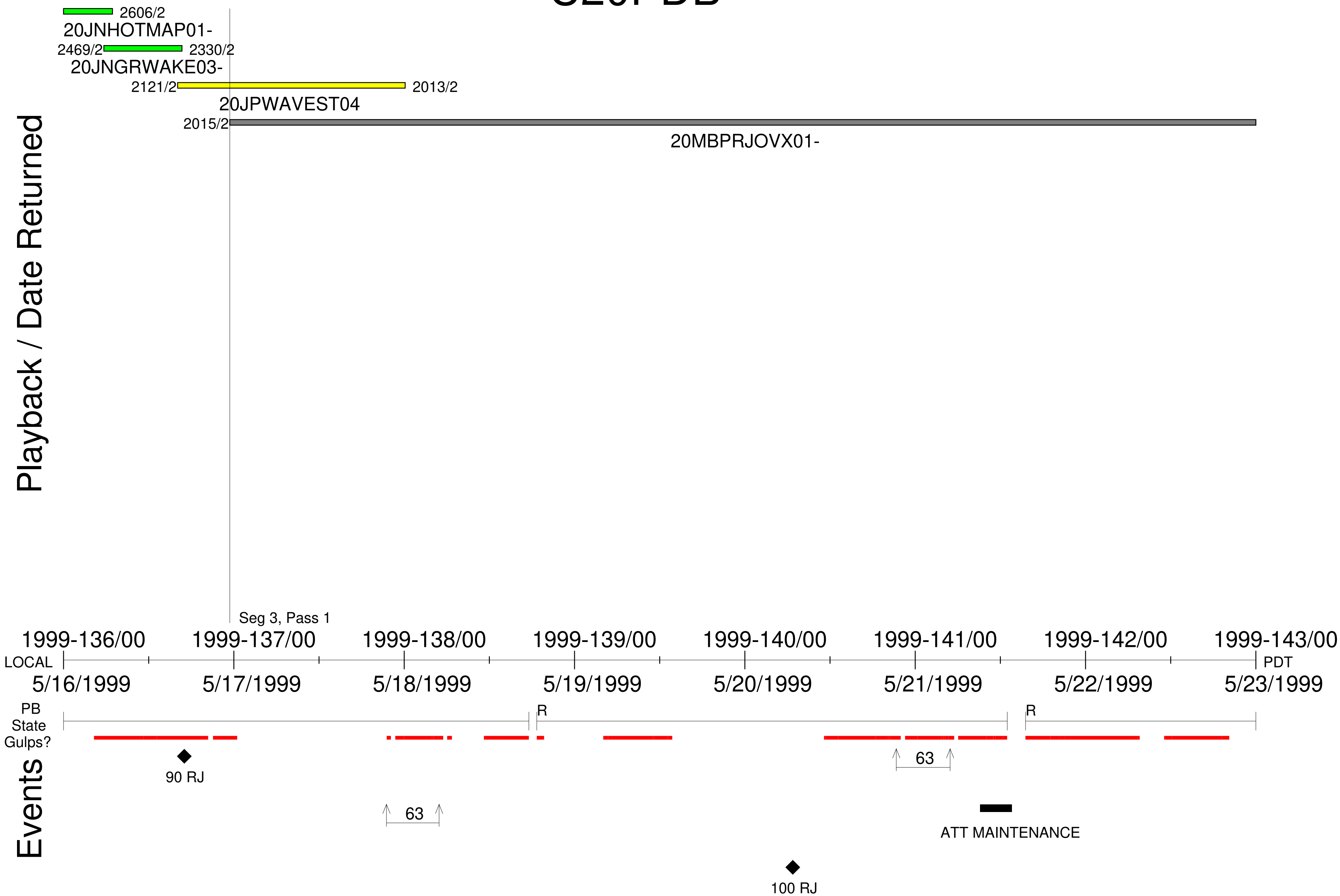
C20PDB



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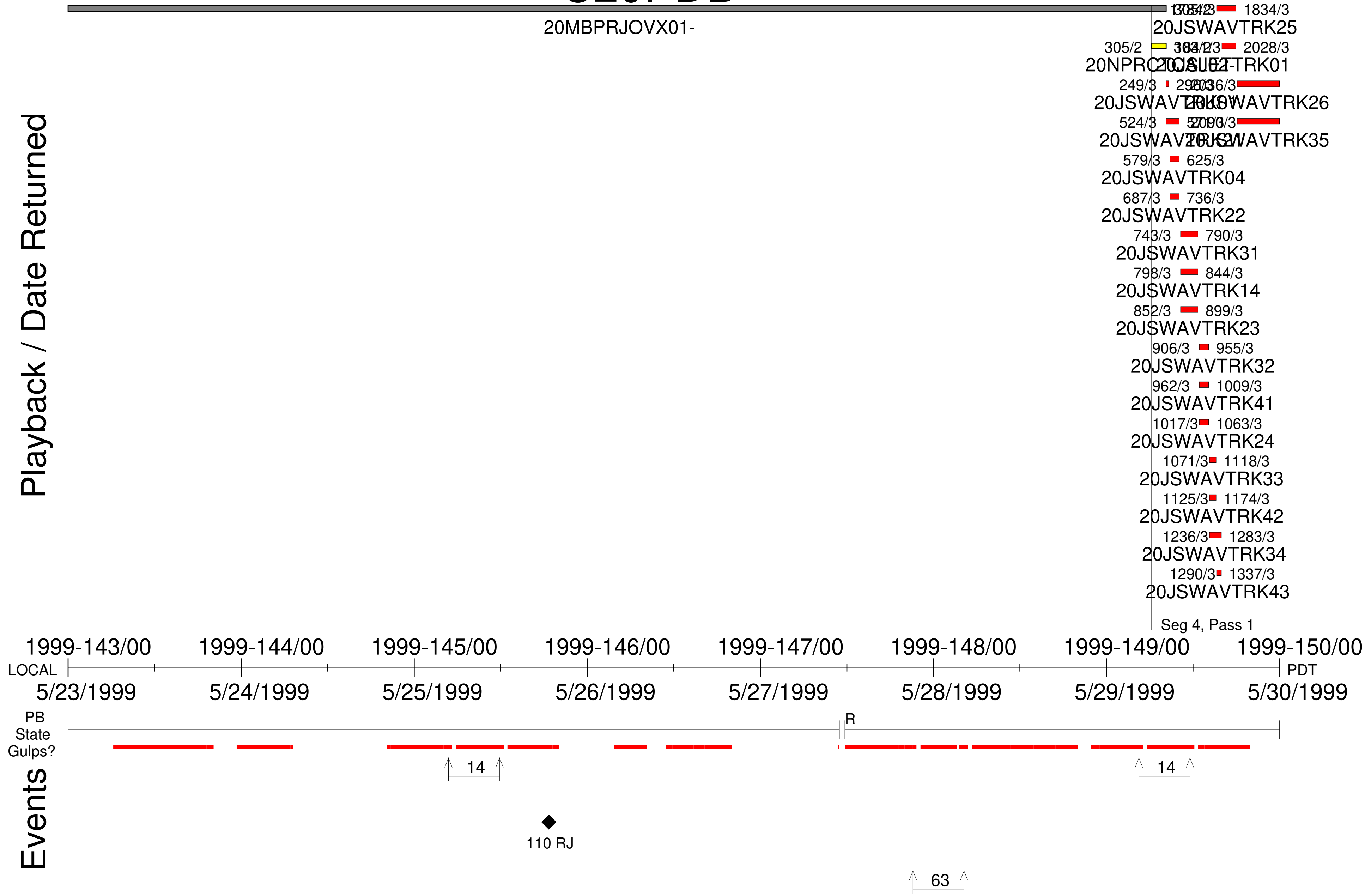

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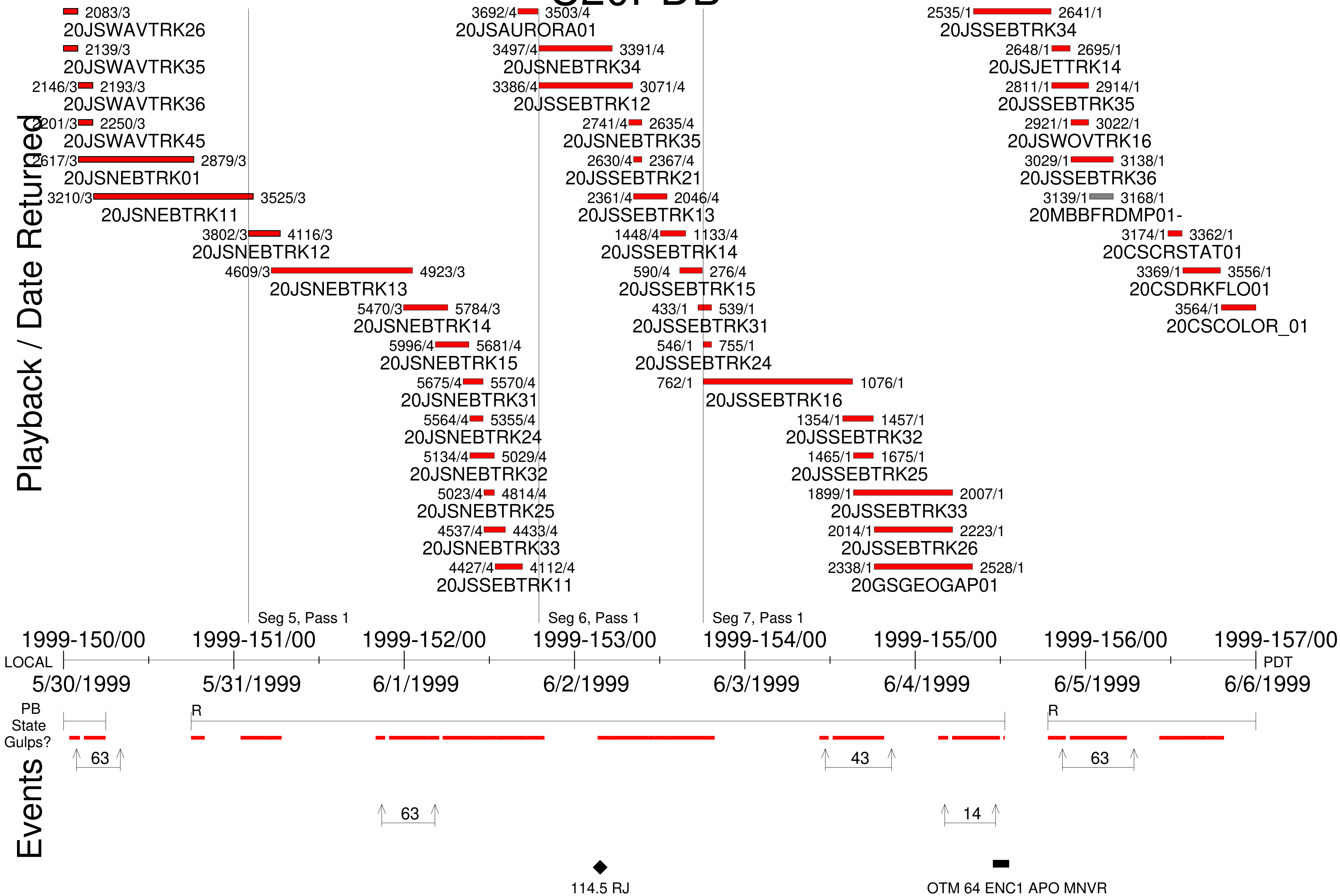
C20PDB



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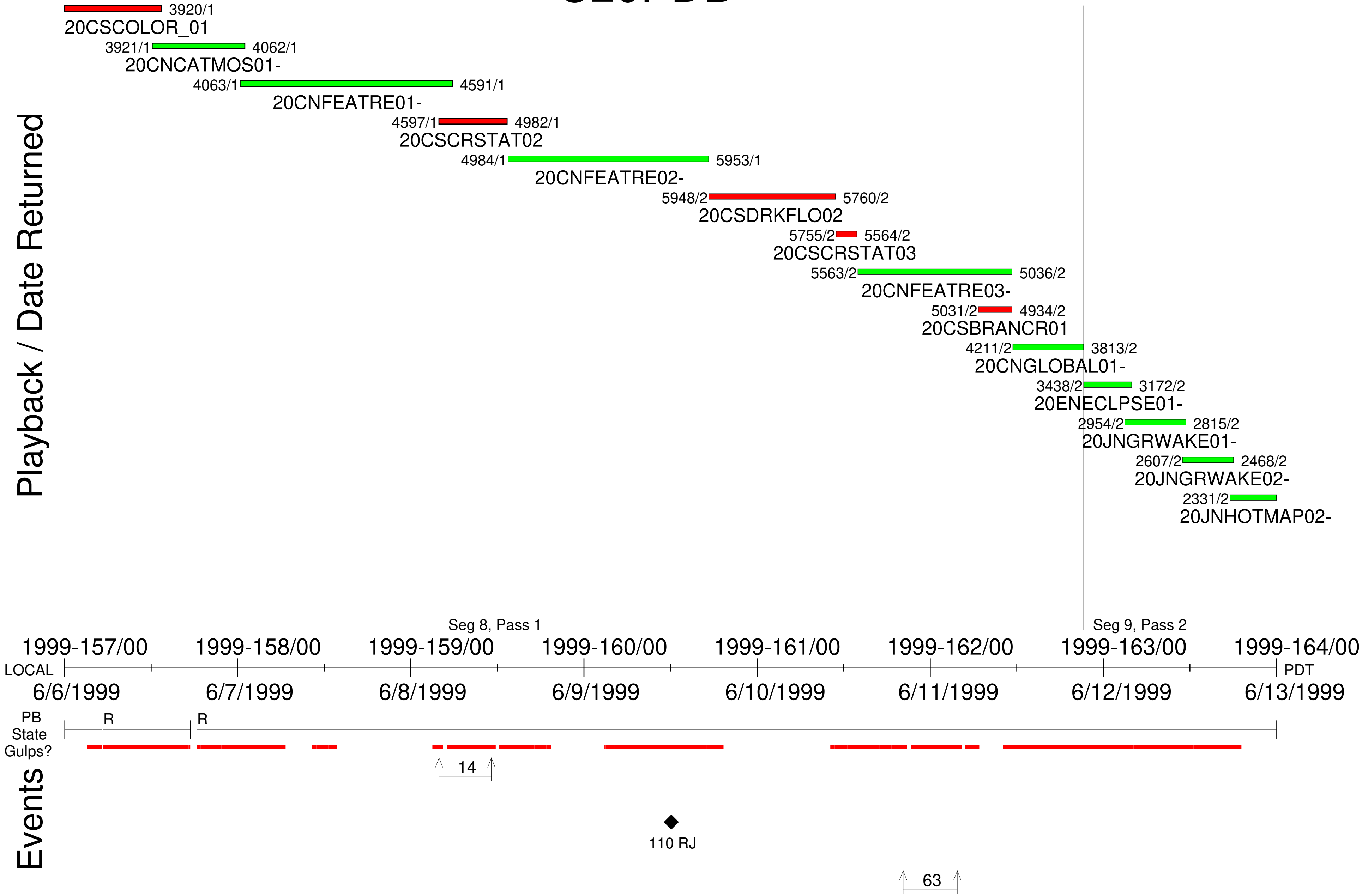
C20PDB



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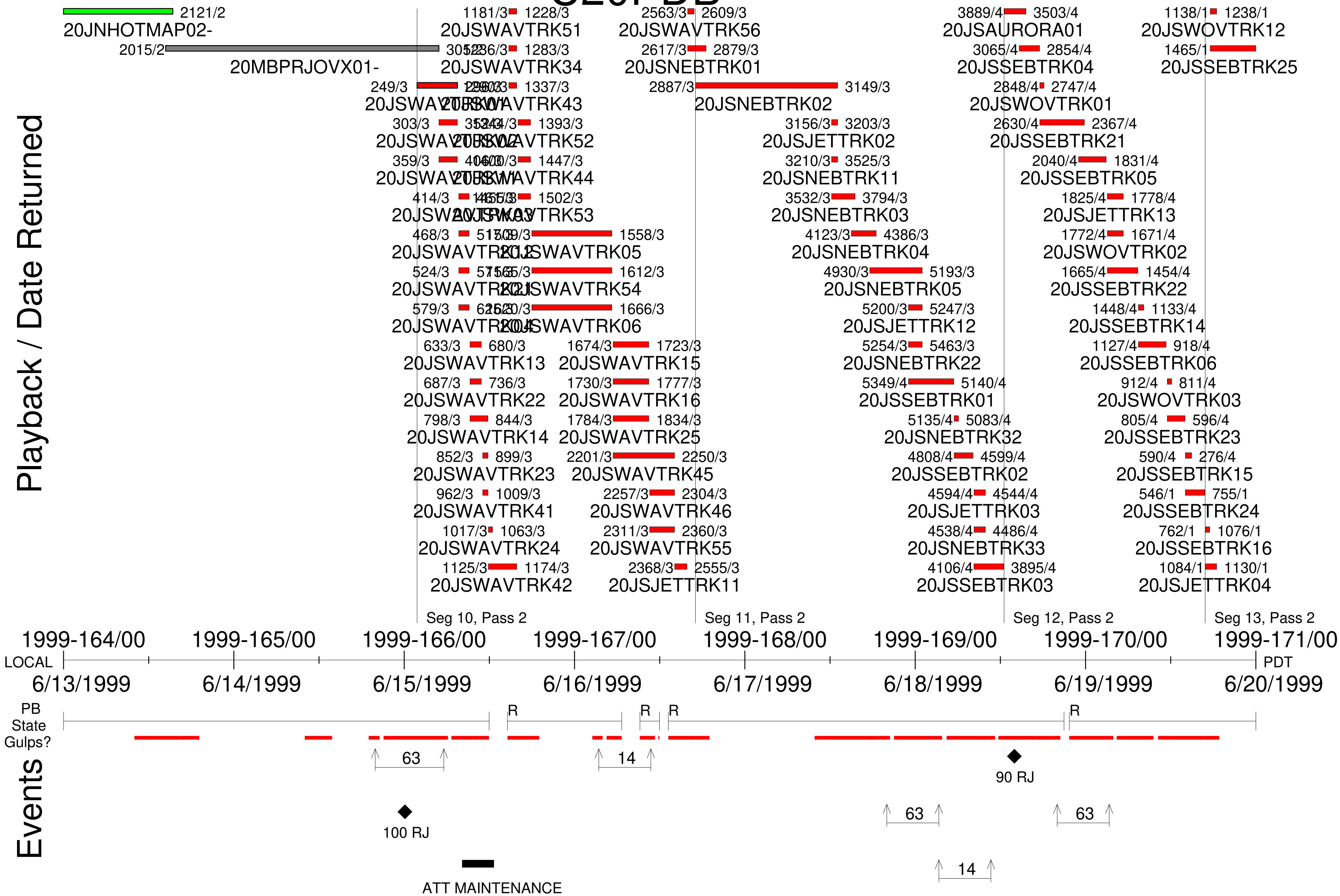
Thu Apr 29 10:58:52 1999, Page 6 of 9

C20PDB



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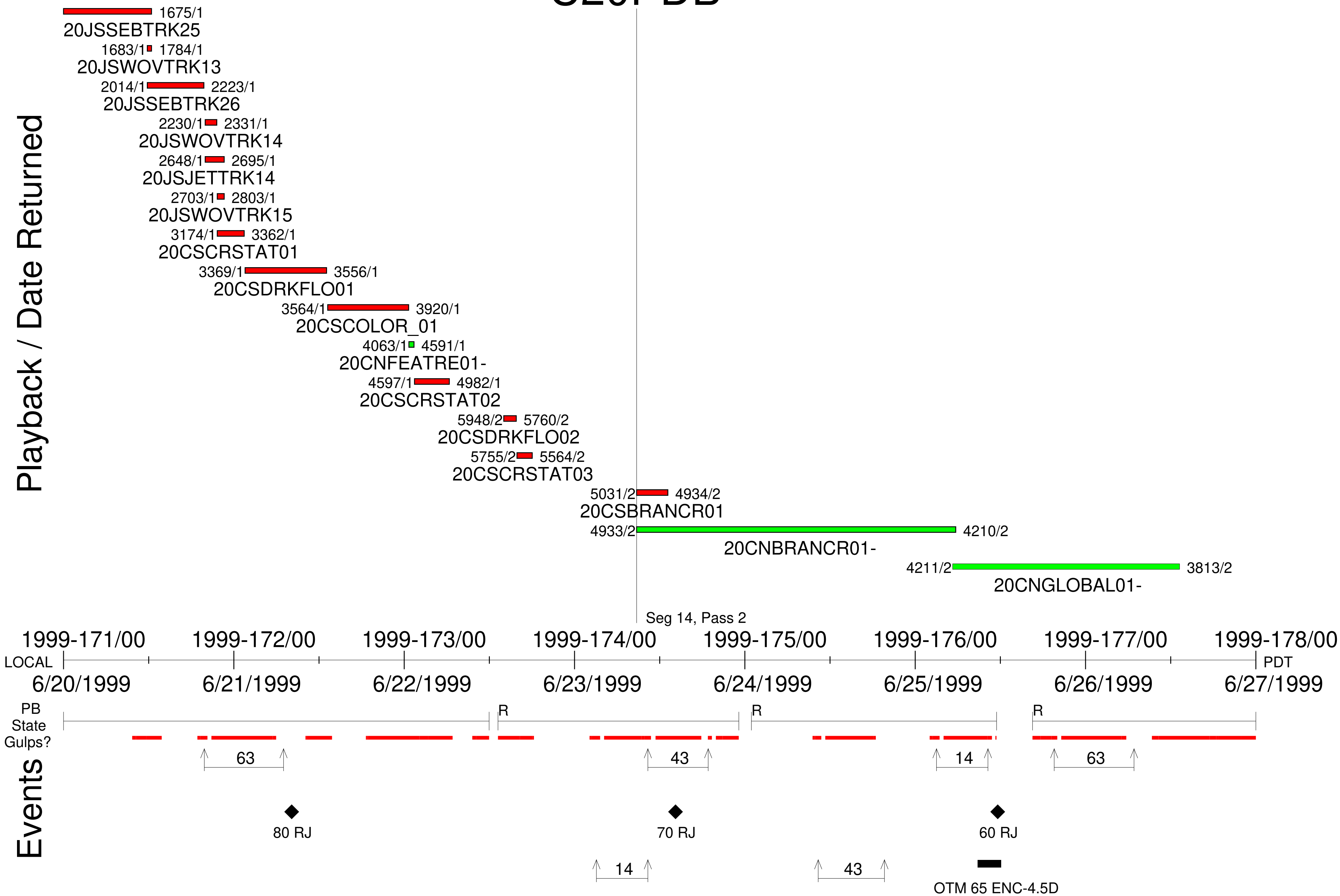
C20PDB



Playback / Date Returned
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20JSSEBTRK25
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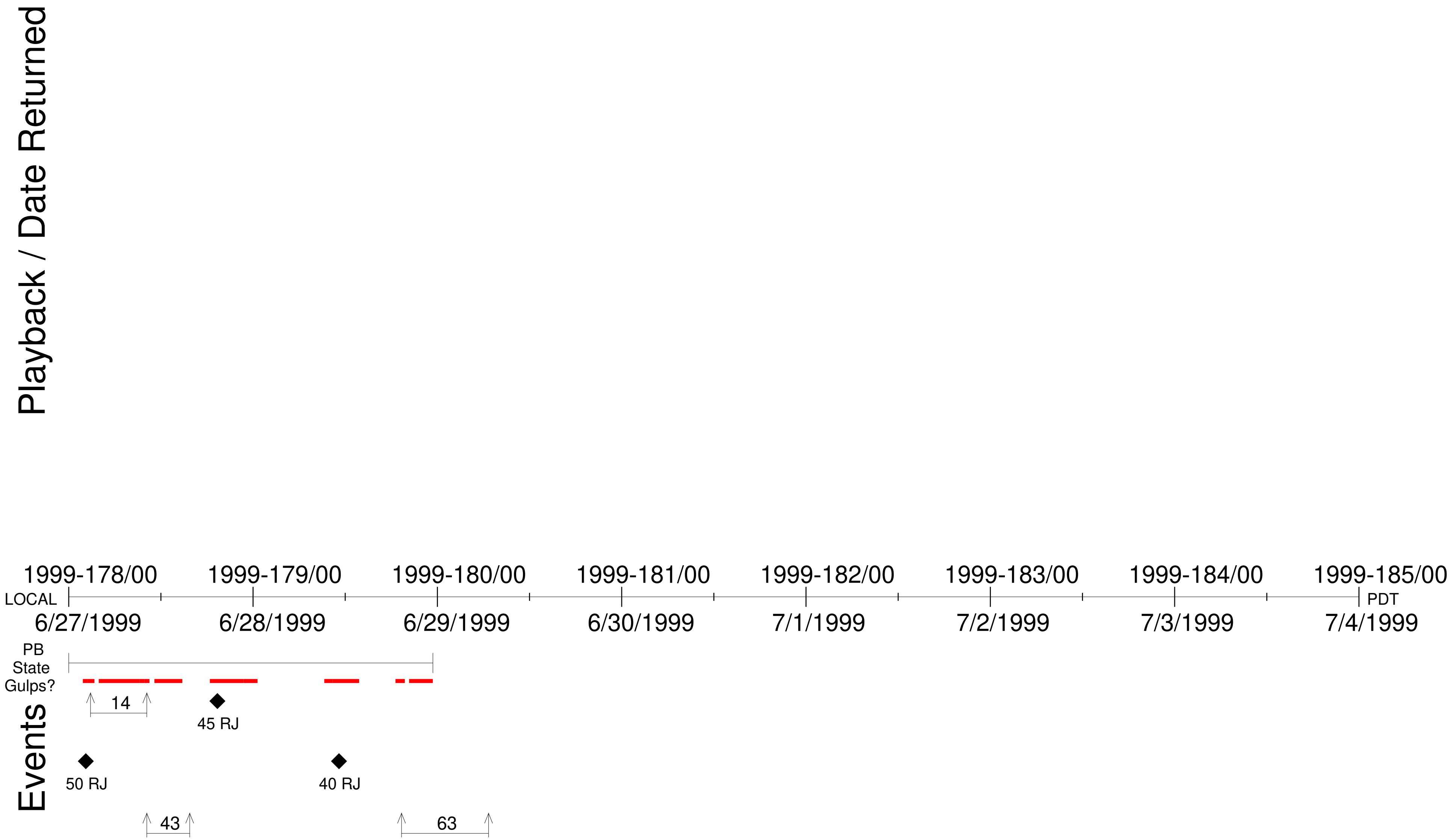

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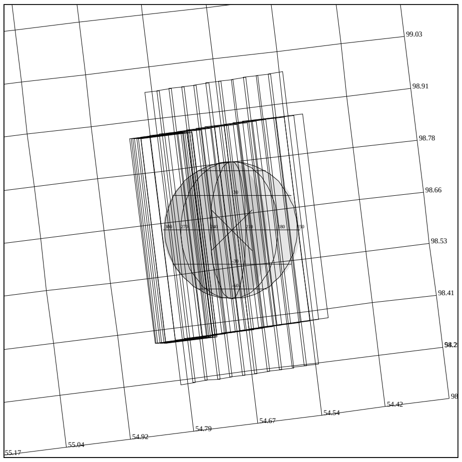

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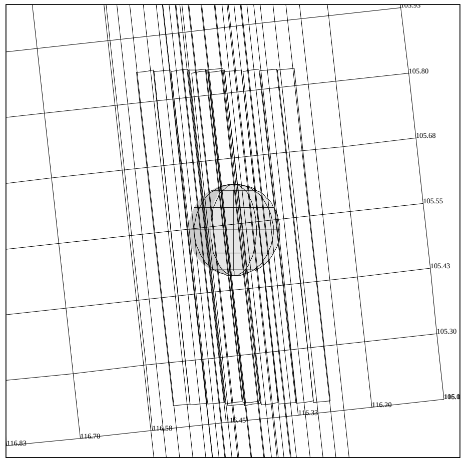

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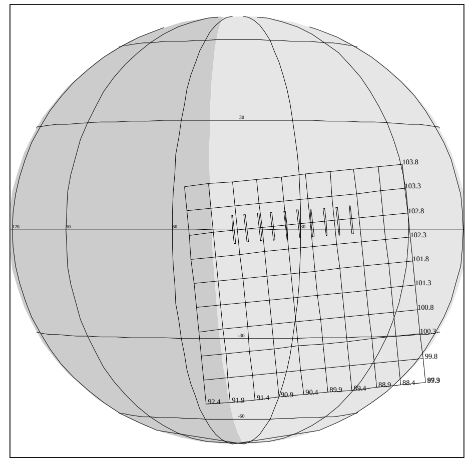

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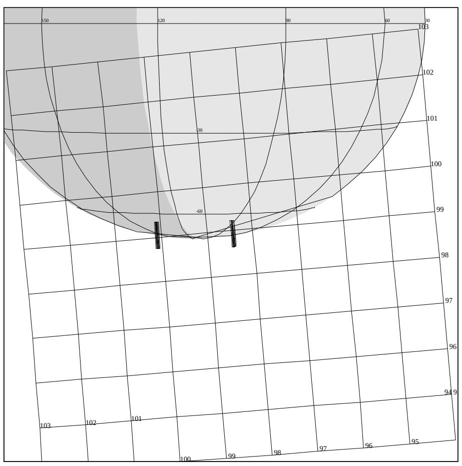

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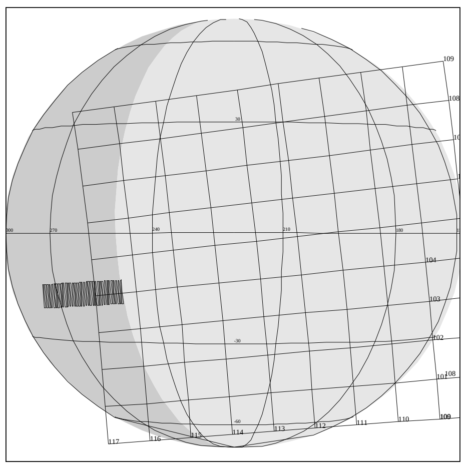

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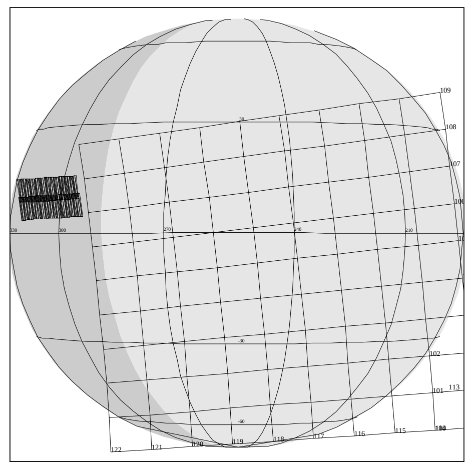

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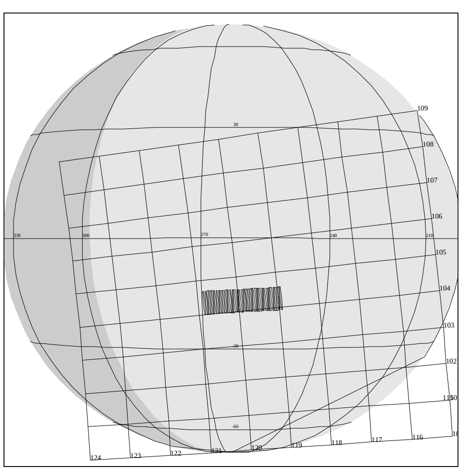

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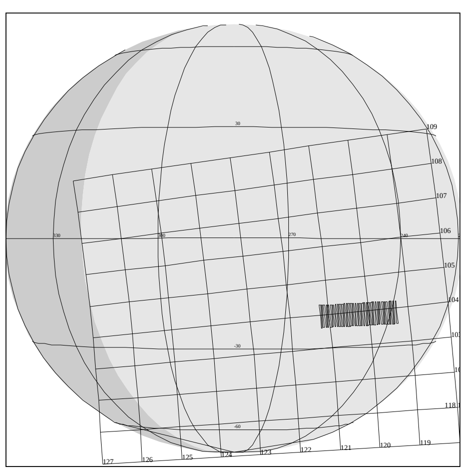

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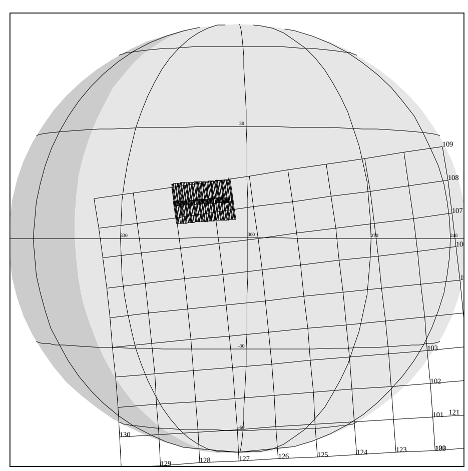

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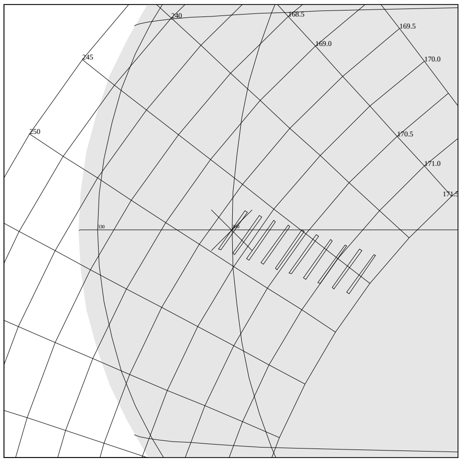

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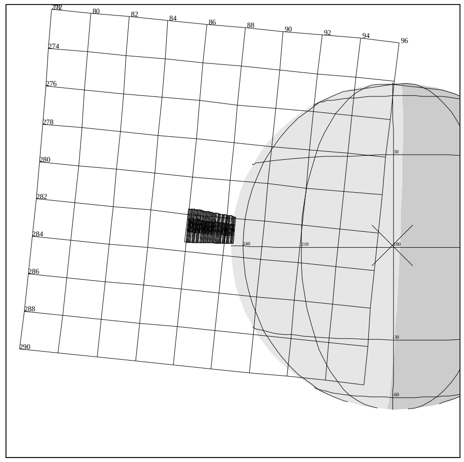

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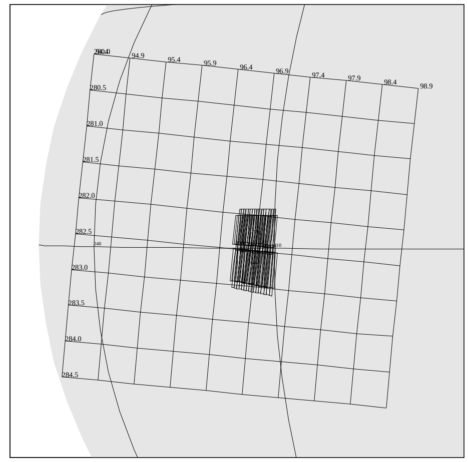

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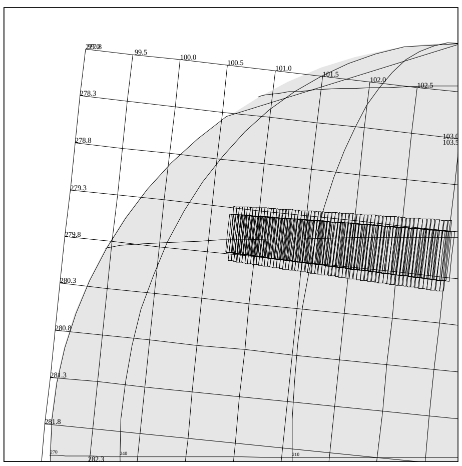

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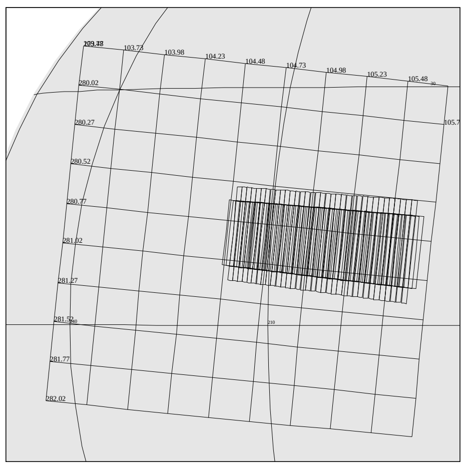

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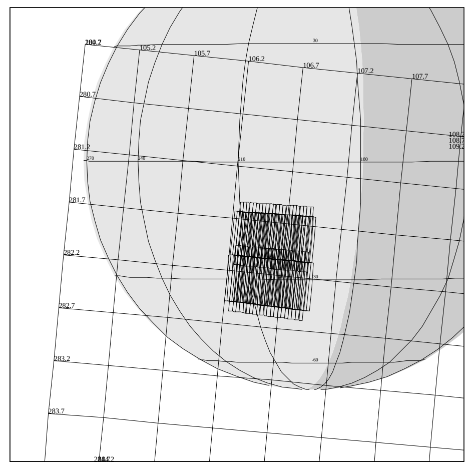

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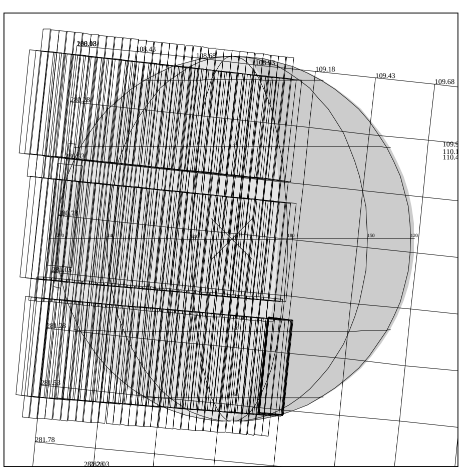

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