Chapter 2 - Orbit Overview

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Introduction to Chapter 2

This chapter gives an overview of the NIMS observations in the E12 Orbit.

The text on page 3 summarizes the NIMS science objectives for E12. The NIMS calibrations are discussed on page 3. Early data return and E12 playback are also discussed on page 3.

The table on page 4 is a time-ordered listing of the NIMS Oapels for E12.

The plot on page 5 shows the geometry of the NIMS E12 observations using a north trajectory pole view projection. The plot on page 6 shows the NIMS Europa regional observations along the trajectory of the E12 Europa flyby. The plot on page 7 shows the geometry of the NIMS E12 calibrations.

The table on page 8 lists various NIMS E12 observing parameters: target latitude/longitude, range, cone angle, incidence angle (light), emission angle (view) and phase angle.

The spreadsheet on page 9 summarizes the various inputs for the NIMS E12 Observations. The spreadsheet on pages 10 and 11 summarizes the resource usage for the NIMS E12 observations.

The timeline on page 12 shows the placement of the E12 observations for all intruments during the E12 Encounter Period.

The tapemap on page 13 shows the placement of the E12 observations on the spacecraft’s tape recorder.

The timeline on pages 14 through 28 shows the preliminary E12 playback schedule.

The NIMS E12 mosaic designs are summarized on page 29.
in time-order.

NIMS E12 SCIENCE OVERVIEW

Jupiter Science

There are three realtime Jupiter observations in E12. Each observation will return 10 Rims of 408 wavelengths. JUPRTS01 looks at the mid-north latitudes at about 30 degrees North. JUPRTS02 looks at the North Equatorial Belt regions at about 7 degrees North. JUPRTS03 looks at southern latitudes at about 15 degrees South.

Io Science

There is one Io observation in E12. INHRSPEC is a high spatial and spectral resolution observation of Io's dayside and nightside.

Europa Science

There are four Europa observations planned for E12. Three regional observations are coordinated with SSI observations. ENGLOBAL is a global map of longitudes not returned during the main mission, from 210 to 300 degrees West longitude. ENDLINEA focuses on a dark linea region (Minos Linea) near 10 degrees North latitude, 272 to 280 degrees West longitude. ENCPWYLL observes the PWYLL impact crater and surrounding areas near 25 degrees South latitude, 271 degrees West longitude. ENICEBRG observes a wedge (ice rift) terrain near 17 degrees South latitude, 173 to 197 degrees West longitude.

Ganymede and Callisto Science

Ganymede and Callisto were not observed in E12.

Calibration

There were three NIMS calibration observations planned for E12: one PCT cal, one RCT cal and one OPCAL. Unfortunately, all of the NIMS calibrations in E12 Cruise were deleted due to the AACS anomaly.

Early Data Return

There are six realtime observations in E12: 3 408 wavelength Jupiter observations (JUPRTS), one PCT calibration, one RCT calibration and one OPCAL (the three calibration observations were cancelled.)

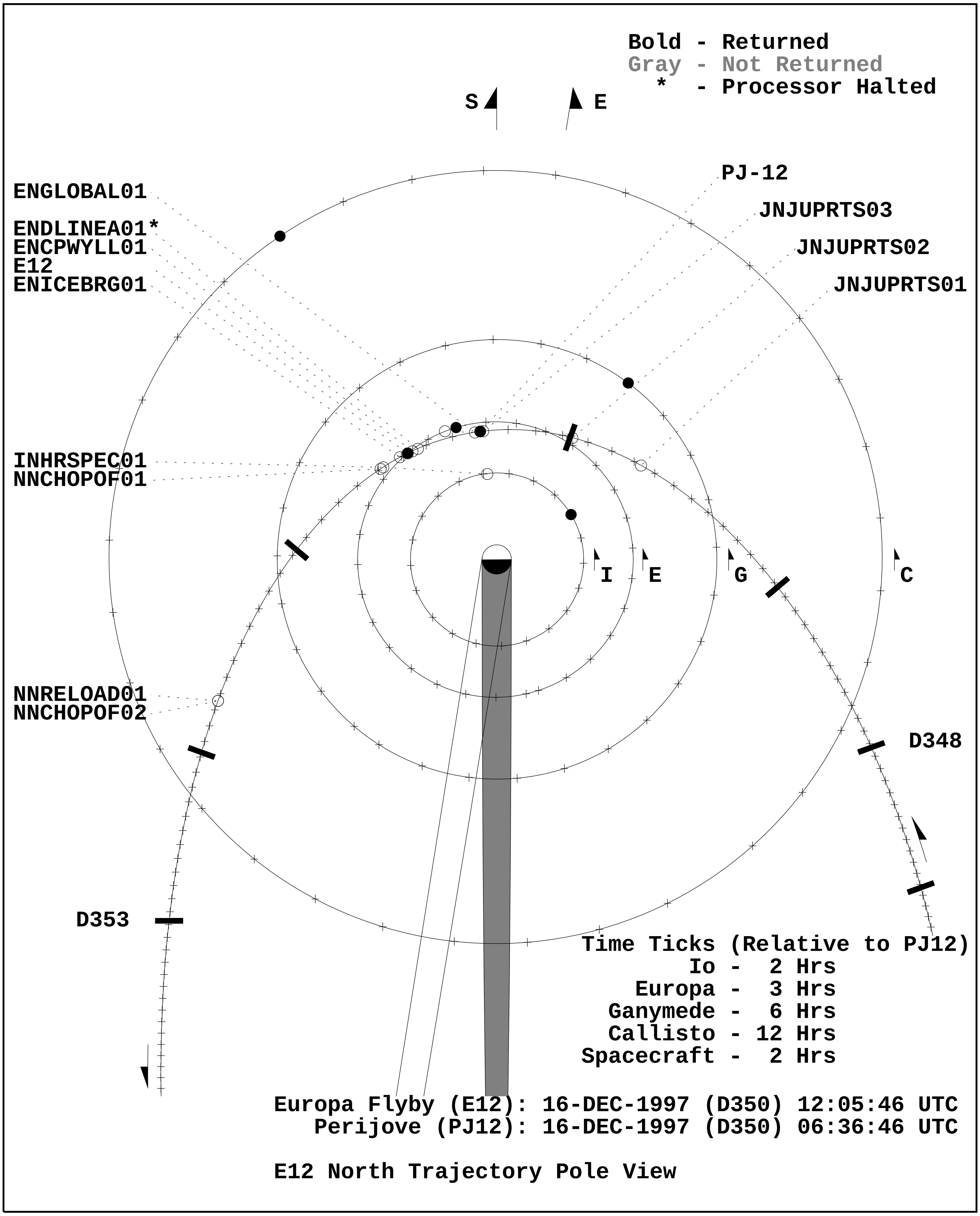
E12 Playback

E12 playback is split into two passes through the tape.

E12 Time-Ordered Listing

OAPEL	Start (UTC)	End (UTC)	Duration
12NNJUPRTS01-	97-349/17:45:09	97-349/17:55:15	000/00:10:06
12JNJUPRTS01*	97-349/17:55:15	97-349/18:10:25	000/00:15:10
12NNJUPRTS02-	97-349/23:39:02	97-349/23:49:09	000/00:10:06
12JNJUPRTS02*	97-349/23:49:09	97-350/00:14:25	000/00:25:16
12NNJUPRTS03-	97-350/06:12:21	97-350/06:22:28	000/00:10:06
12JNJUPRTS03*	97-350/06:22:28	97-350/06:37:38	000/00:15:10
12NNGLOBAL01-	97-350/06:48:45	97-350/06:58:52	000/00:10:06
12ENGLOBAL01-	97-350/06:58:52	97-350/07:38:18	000/00:39:26
12NNDLINEA01-	97-350/11:05:35	97-350/11:15:41	000/00:10:06
12ENDLINEA01-	97-350/11:15:41	97-350/11:24:47	000/00:09:06
12NNCPWYLL01-	97-350/11:31:52	97-350/11:41:59	000/00:10:06
12ENCPWYLL01-	97-350/11:41:59	97-350/11:56:08	000/00:14:09
12NNICEBRG01-	97-350/12:32:32	97-350/12:42:39	000/00:10:06
12ENICEBRG01-	97-350/12:42:39	97-350/12:59:50	000/00:17:11
12NNHRSPEC01-	97-350/13:58:29	97-350/14:08:35	000/00:10:06
12INHRSPEC01-	97-350/14:09:36	97-350/14:23:45	000/00:14:09
12NNCHOPOF01-	97-350/14:23:45	97-350/14:33:52	000/00:10:06
12NNRELOAD01-	97-351/17:29:37	97-351/17:39:44	000/00:10:06
12NNCHOPOF02-	97-351/17:39:44	97-351/17:49:51	000/00:10:06
12NNRCTRLT01-	98-028/10:00:00	98-028/23:21:48	000/13:21:48
12NNPCTRLT01-	98-035/00:00:00	98-035/07:50:10	000/07:50:10

NIMS E12 OBSERVATIONS

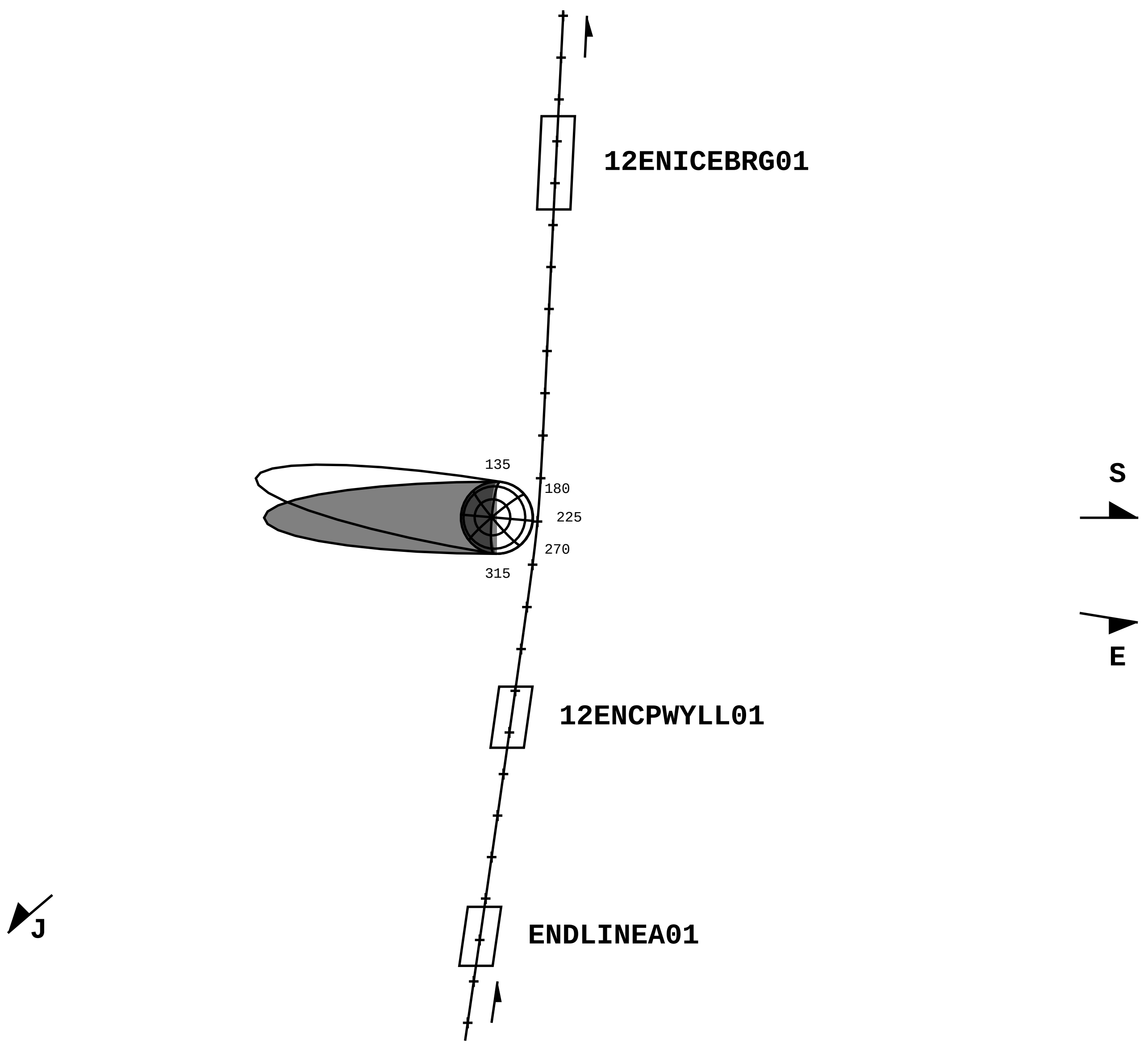


NIMS - FEL - 06/03/99

NIMS E12 EUROPA FLYBY OBSERVATIONS

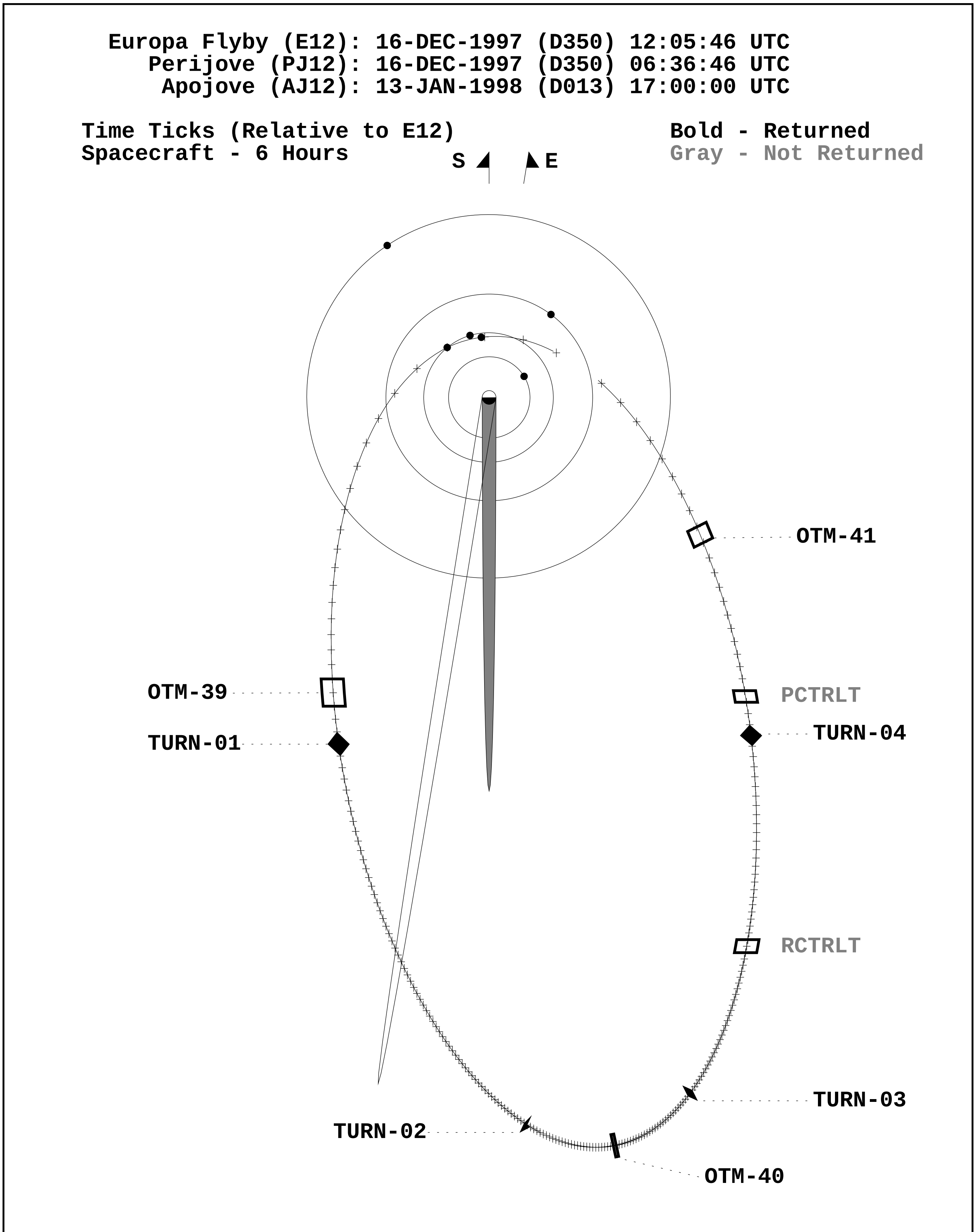
Europa Flyby (E12): 16-DEC-1997 (D350) 12:05:46 UTC

Time Ticks (Relative to E12)
Spacecraft - 5 Minutes



E12 North Trajectory Pole View, +/- 1 Hour

NIMS E12 CRUISE CALIBRATIONS



E12 North Trajectory Pole View, Perijove to Perijove

NIMS E12 OBSERVING GEOMETRY

OAPEL	Latitude (deg)	Longitude (deg)	Range (km)	Cone (deg)	Light (deg)	View (deg)	Phase (deg)
12JNJUPRTS01	+20 to +38	247 to 256	783K	131	35 to 43	36 to 49	59
12JNJUPRTS02	+3 to +10	123 to 163	636K	162	46 to 74	18 to 49	28
12JNJUPRTS03	-20 to -7	309 to 315	559K	162	11 to 19	10 to 19	7
12ENGLOBAL01	-90 to +90	209 to 301	100K	91	13 to 99	11 to 90	99
12ENDLINEA01	+7 to +13	272 to 279	14K	96	55 to 62	33 to 41	95
12ENCPWYLL01	-27 to -23	271 to 273	4.0K	100	56 to 58	41 to 47	80
12ENICEBRG01	-20 to -14	173 to 196	17K	85	31 to 53	37 to 60	85
12INHRSPEC01	-90 to +90	10 to 190	515K	83	2 to 177	0 to 90	87

E12 NIMS INPUTS

Activity ID	Observation Title	NIMS Edit Table	NIMS PB Table	Mode	Gain	Grating start	Grating Offset	Record Format	PSID
12NNJUPRTS01-	NIMS Real-Time Software Reload								DA
12JNJUPRTS01*	Jupiter Realtime Observation	E12JLM442/MB	R/T	LM	2	0	4	R/T	DA
12NNJUPRTS02-	NIMS Real-Time Software Reload								DB
12JNJUPRTS02*	Jupiter Realtime Observation	E12JLM442/MB	R/T	LM	2	0	4	R/T	DB
12NNJUPRTS03-	NIMS Real-Time Software Reload								DC
12JNJUPRTS03*	Jupiter Realtime Observation	E12JLM442/MB	R/T	LM	2	0	4	R/T	DC
12NNGLOBAL01-	NIMS Real-Time Software Reload								DD
12ENGLOBAL01-	Europa Global	E12ELM442	E12ELM228C	LM	2	0	4	MPW	DD
12NNDLINEA01-	NIMS Real-Time Software Reload								DE
12ENDLINEA01-	Surface Comp. and Minos Linea	E12ELM442	E12ELM228C	LM	3	0	4	MPW	DE
12NNCPWYLL01-	NIMS Real-Time Software Reload								DF
12ENCPWYLL01-	Europa Surf. Comp. and Mineos Linea	E12ELM442	E12ELM328	LM	2	0	4	MPW	DF
12NNICEBRG01-	NIMS Real-Time Software Reload								DG
12ENICEBRG01-	Europa Surface Composition	E12ELM442	E12ELM228C	LM	2	0	4	MPW	DG
12NNHRSPEC01-	NIMS Real-Time Software Reload								DH
12INHRSPEC01-	Io Monitoring at High Spectral Resolutio	E12ILM442	E12ILM360	LM	2	0	4	MPW	DH
12NNCHOPOF01-	Chopper off								DI
12NNRELOAD01	NIMS Real-Time Software Reload								
12NNCHOPOF02-	Chopper off								
12NNRCTRLT01-	NIMS RCT Real-Time Calibration	E12RCT252	R/T	LM	1	0	4	R/T	XE
12NNPCTRLT01-	NIMS Real-Time PCT Calibration	E12PCT252	R/T	LM	4	0	4	R/T	FA

E12 NIMS RESOURCES

Activity ID	NIMS Mode	Record Mode	Obs. Cost (tracks)	Obs. Cost (ticks)	Number wavelengths Returned	Observation Record Time (sec.)	Observation Playback Time (sec.)	Selected Bits of Tape sBOT (Mbits)	Bits of Tape BOT (Mbits)	Mode Cycle time (sec)
12JNJUPRTS01	LM	R/T			360					
12JNJUPRTS02	LM	R/T			360					
12JNJUPRTS03	LM	R/T			360					
12ENGLOBAL01	LM	MPW	0.3067	1787	228	2030.7	243	2.80	23.39	8.667
12ENDLINEA01	LM	MPW	0.0645	376	360	424.7	211	2.43	4.89	8.667
12ENCPWYLL01	LM	MPW	0.0671	391	360	442	122	1.41	5.09	8.667
12ENICEBRG01	LM	MPW	0.1011	589	360	667.3	122	1.41	7.69	8.667
12INHRSPEC01	LM	MPW	0.0772	450	360	509	269	3.10	5.86	8.667
12ENGLOBAL01	LM	MPW	0.3067	1787	168	2030.7	303	3.49	23.39	8.667
12ENGLOBAL01	LM	MPW	0.3067	1787	168	2030.7	303	3.49	23.39	8.667
12ENCPWYLL01	LM	MPW	0.0671	391	360	442	333	3.84	5.09	8.667
12ENICEBRG01	LM	MPW	0.1011	589	360	667.3	624	7.19	7.69	8.667
12INHRSPEC01	LM	MPW	0.0772	450	360	509	316	3.64	5.86	8.667
Total									70.32	
Allocation										

E12 NIMS RESOURCES

Activity ID	AACS Mbits Comp 2.5	RT BTG Mbits	Thold	Comp	Total MBTG (4% Ohead)	Data Reduct Factor (sBOT/BTG)	Pass	Total MBTG (4% Ohead) Europa	Total MBTG (4% Ohead) Io	Total MBTG Jupiter
12JNJUPRTS01*		0.16								0.16
12JNJUPRTS02*		0.32								0.32
12JNJUPRTS03*		0.16								0.16
12ENGLOBAL01-	0.01		0	1.38	0.9635	2.91	1	0.9635		
12ENDLINEA01-	0.01		0		0.076		1	0.0760		
12ENCPWYLL01-	0.01		0	1.34	0.7866	1.79	1	0.7866		
12ENICEBRG01-	0.01		0	1.36	0.7750	1.81	1	0.7750		
12INHRSPEC01-	0.02		2	1.68	1.3834	2.24	1		1.3834	
12ENGLBAL01B-	0.02		0	1.46	0.8367	4.17	2	0.8367		
12ENGLBAL01C-	0.02		0	1.46	0.8367	4.17	2	0.8367		
12ENCPWYLL01-	0.02		0	1.34	2.1470	1.79	2	2.1470		
12ENICEBRG01-	0.04		0	1.35	3.9934	1.80	2	3.9934		
12INHRSPEC01-	0.02		2	1.68	1.6251	2.24	2		1.6251	
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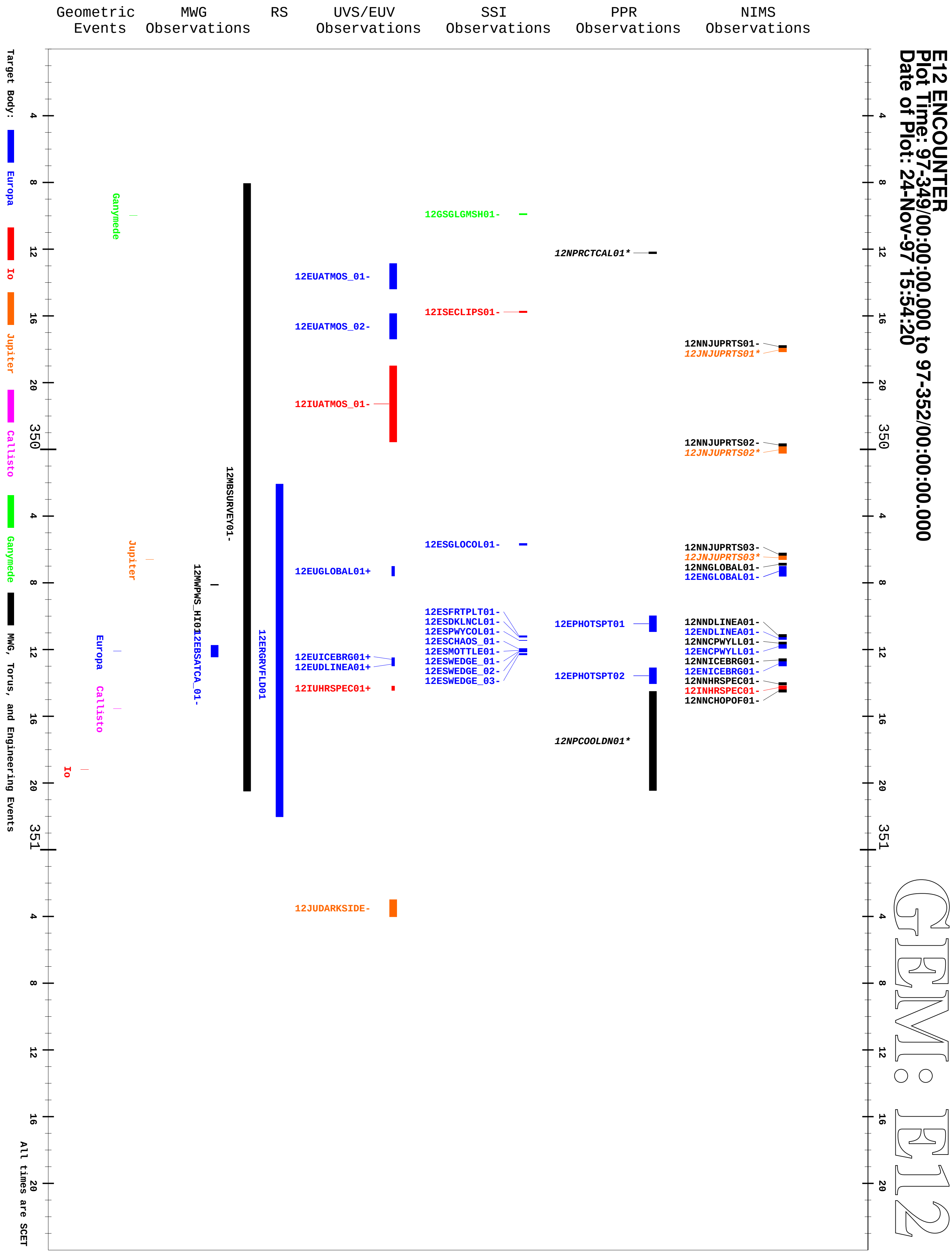
					12.7970	Allocation				
					0.6266	Over/Under				


E12 ENCOUNTER
Plot Time: 97-349/00:00:00.000 to 97-352/00:00:00.000
Date of Plot: 24-Nov-97 15:54:20
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
350
351
12MBSURVEY01-
12MWPWS_HI01
12EBSATCA_01-
12ERGRVFLD01
12EUATMOS_01-
12EUATMOS_02-
12IUATMOS_01-
12EUGLOBAL01+
12EUICEBRG01+
12EUDLINEA01+
12IUHRSPEC01+
12JUDARKSIDE-
12GSGLGMSH01-
12ISECLIPS01-
12ESGLOCOL01-
12ESFRTPLT01-
12ESDKLNCL01-
12ESPWYCOL01-
12ESCHAOS_01-
12ESMOTTLE01-
12ESWEDGE_01-
12ESWEDGE_02-
12ESWEDGE_03-
12NPRCTCAL01*
12EPHOTSPT01
12EPHOTSPT02
12NPCOOLDN01*
12NNJUPRTS01-
12JNJUPRTS01*
12NNJUPRTS02-
12JNJUPRTS02*
12NNJUPRTS03-
12JNJUPRTS03*
12NNGLOBAL01-
12ENGLOBAL01-
12NNDLINEA01-
12ENDLINEA01-
12NNCPWYLL01-
12ENCPWYLL01-
12NNICEBRG01-
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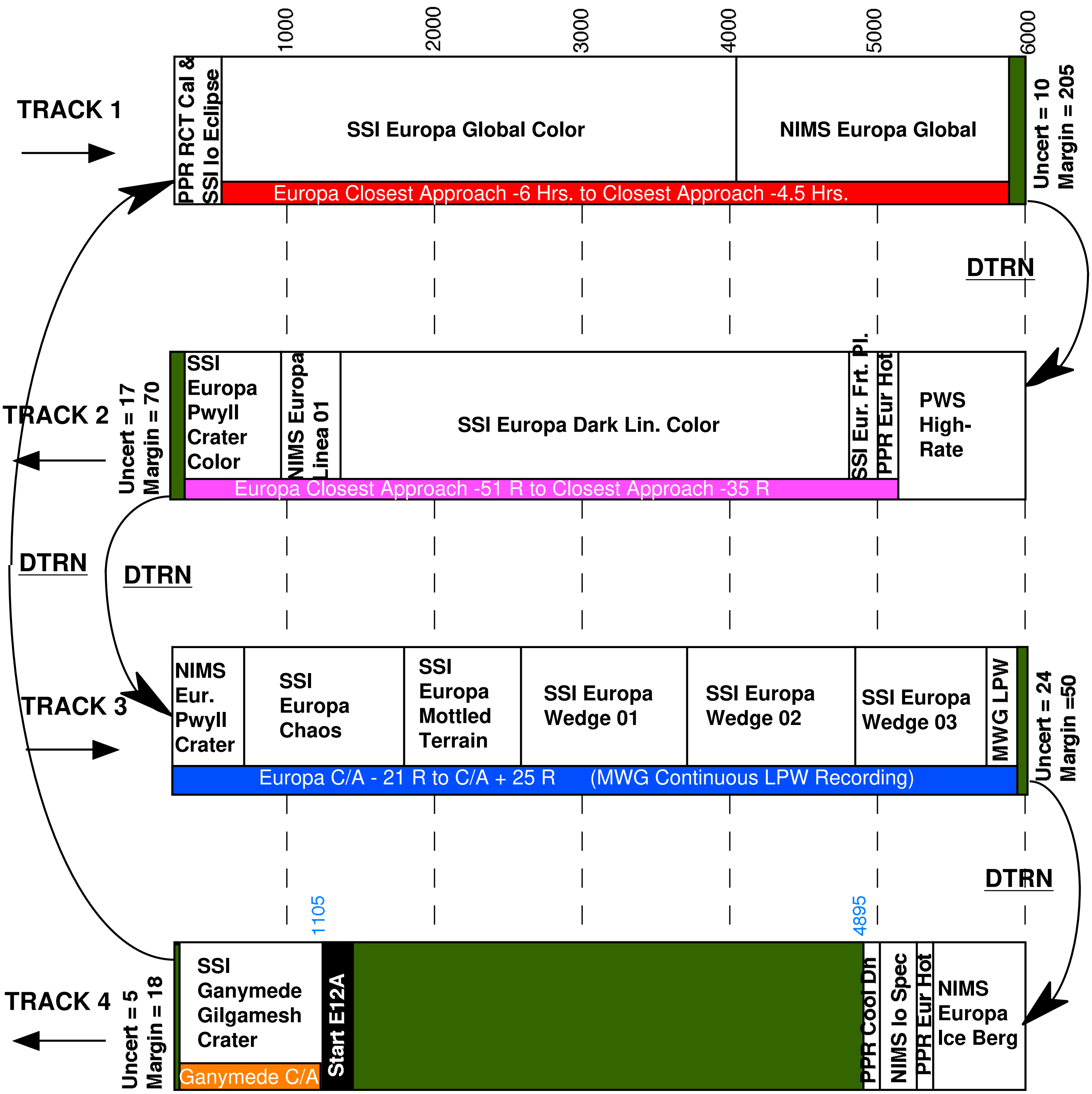
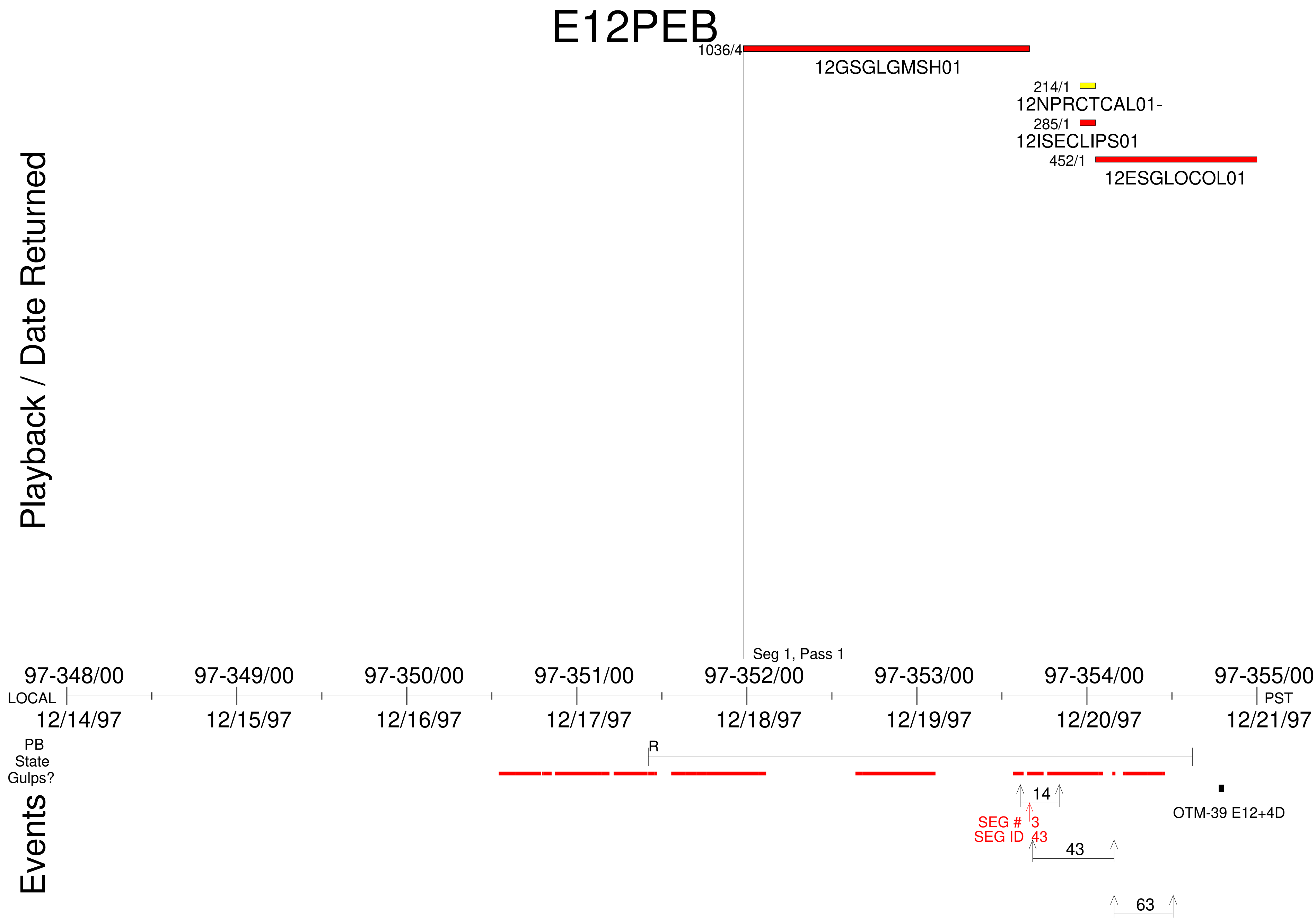
12NNHRSPEC01-
12INHRSPEC01-
12NNCHOPOF01-
GEM: E12

E12 HIGH-LEVEL TAPEMAP



J. Gross, 11/14/97



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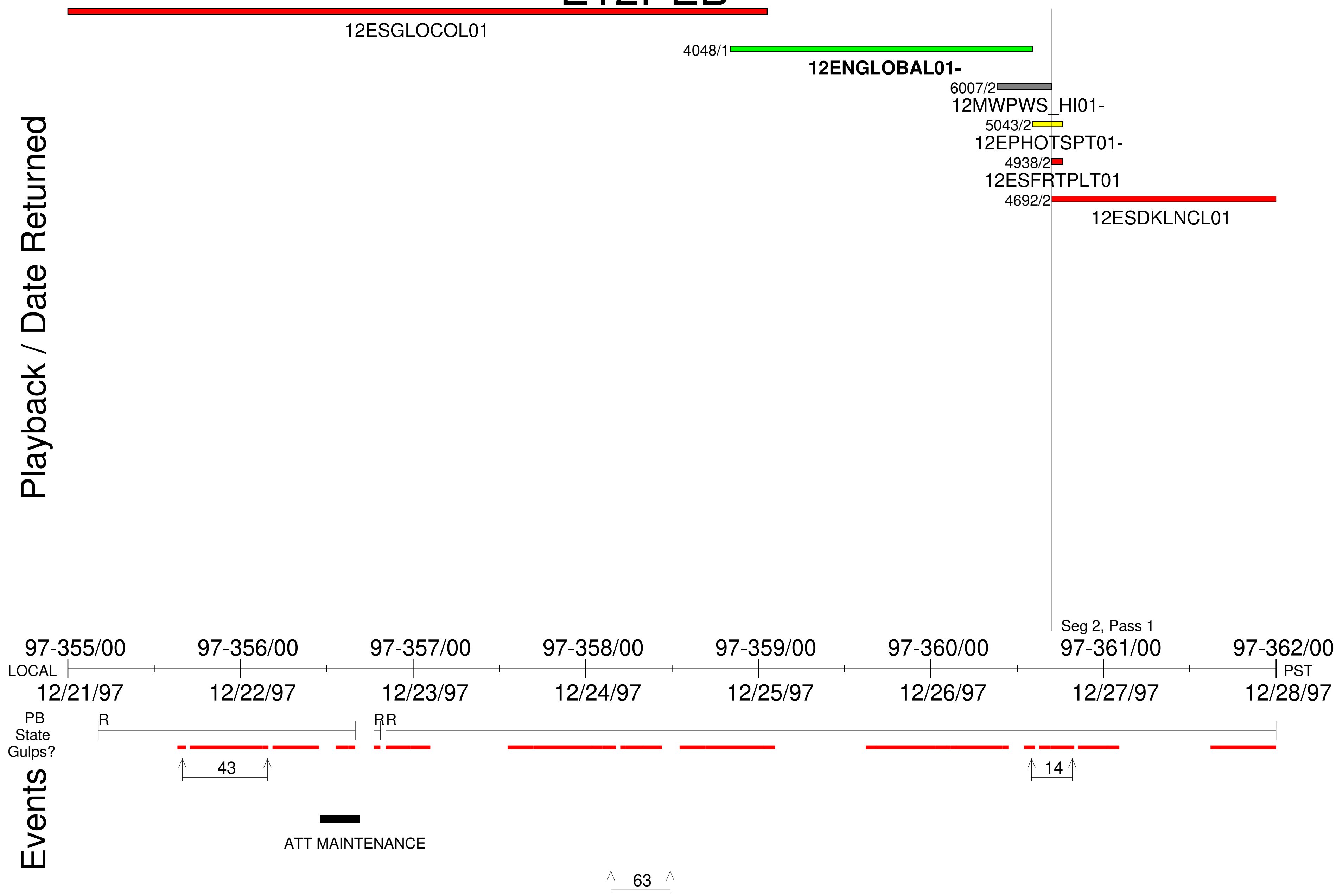
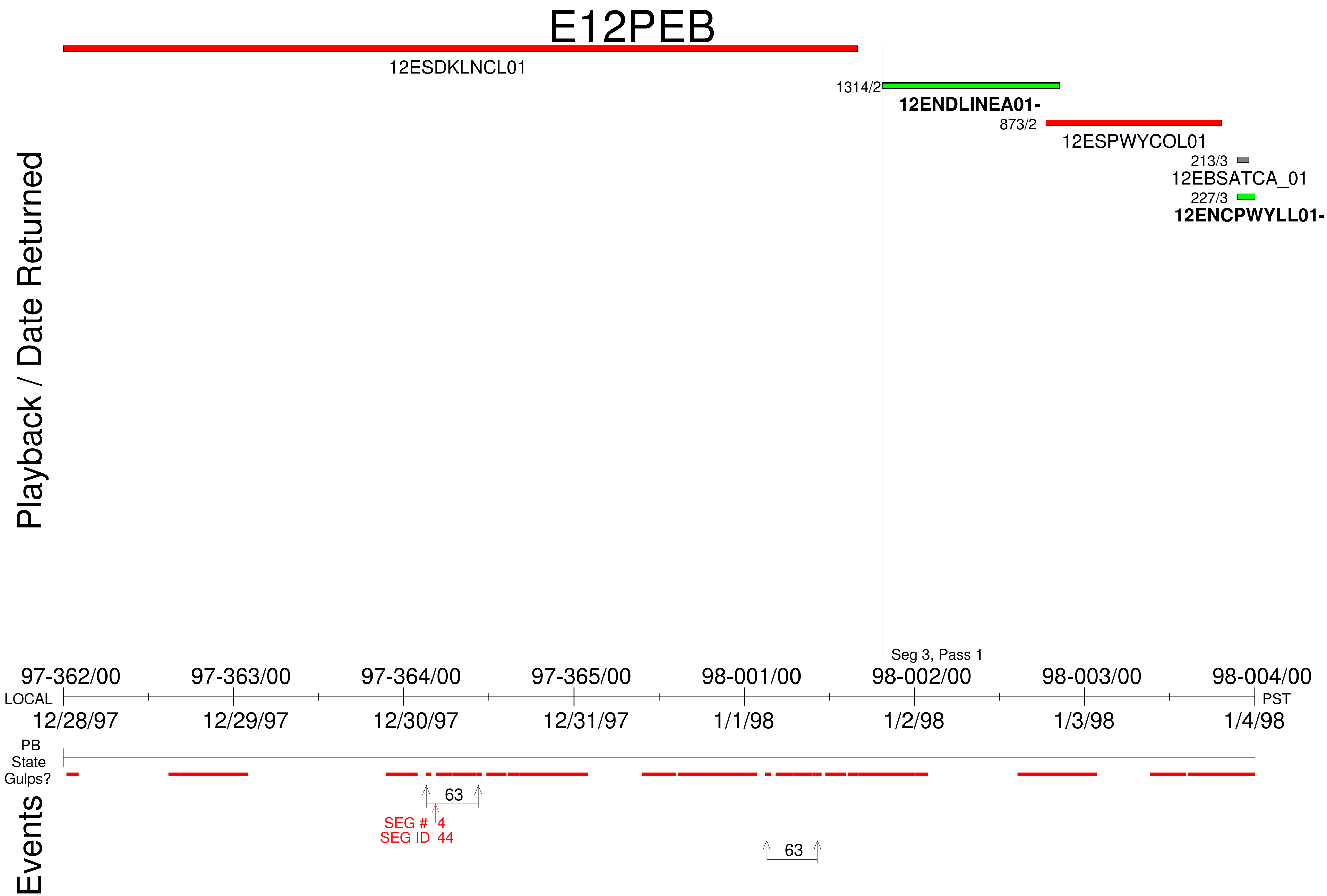
E12PEB



Playback / Date Returned
12ESGLOCOL01
4048/1
12ENGLOBAL01-
6007/2
12MWPWS_HI01-
5043/2
12EPHOTSPT01-
4938/2
12ESFRTPLT01
4692/2
12ESDKLNCL01
Seg 2, Pass 1
97-355/00
97-356/00
97-357/00
97-358/00
97-359/00
97-360/00
97-361/00
97-362/00
LOCAL
PST
12/21/97
12/22/97
12/23/97
12/24/97
12/25/97
12/26/97
12/27/97
12/28/97
PB State
Gulps?
R
RR
43
14
ATT MAINTENANCE
63
Events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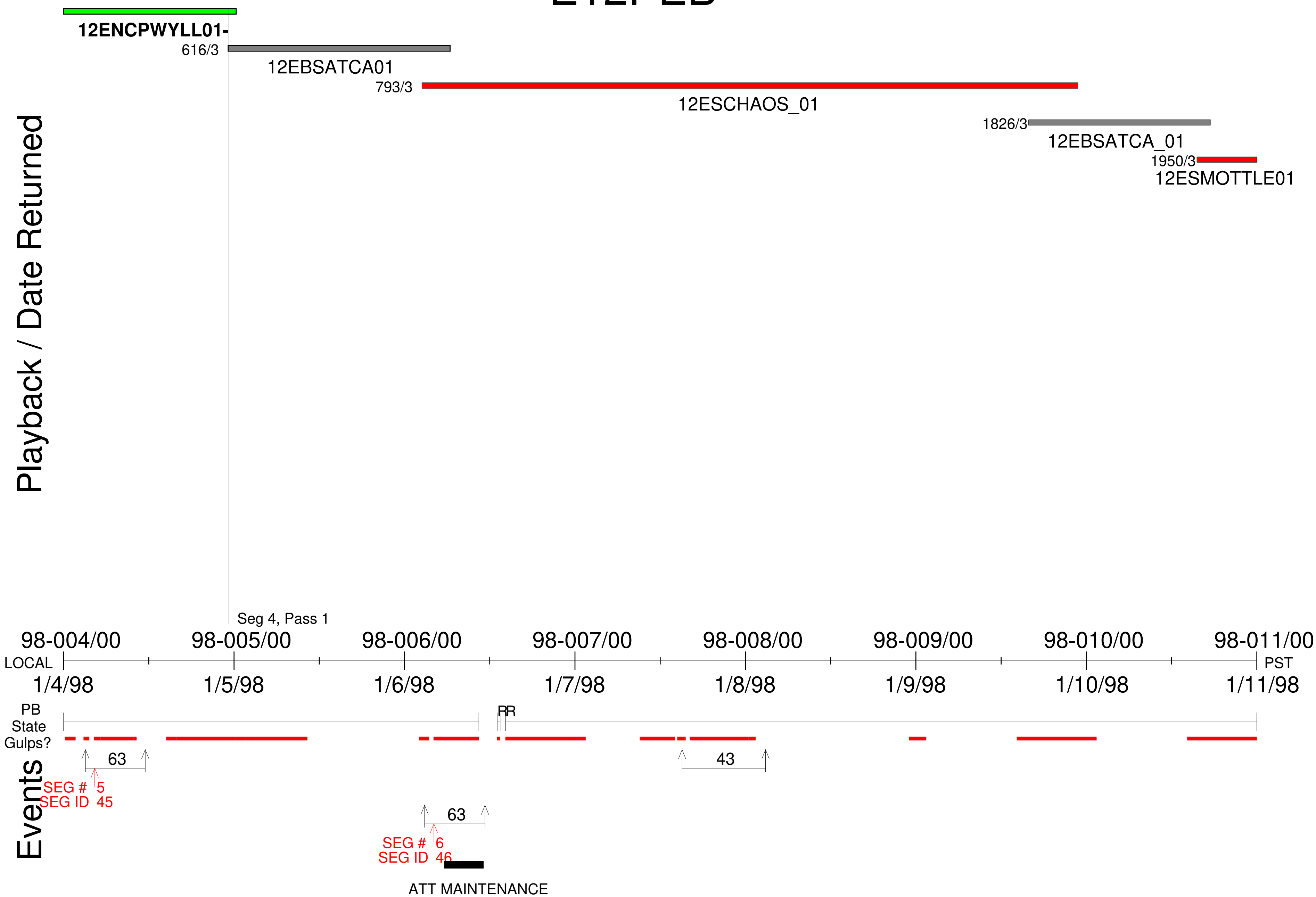
12ESDKLNCL01
1314/2
12ENDLINEA01-
873/2
12ESPWYCOL01
213/3
12EBSATCA_01
227/3
12ENCPWYLL01-
Seg 3, Pass 1
97-362/00
97-363/00
97-364/00
97-365/00
98-001/00
98-002/00
98-003/00
98-004/00
LOCAL
PST
12/28/97
12/29/97
12/30/97
12/31/97
1/1/98
1/2/98
1/3/98
1/4/98
PB
State
Gulps?
Events
63
SEG # 4
SEG ID 44
63

E12PEB



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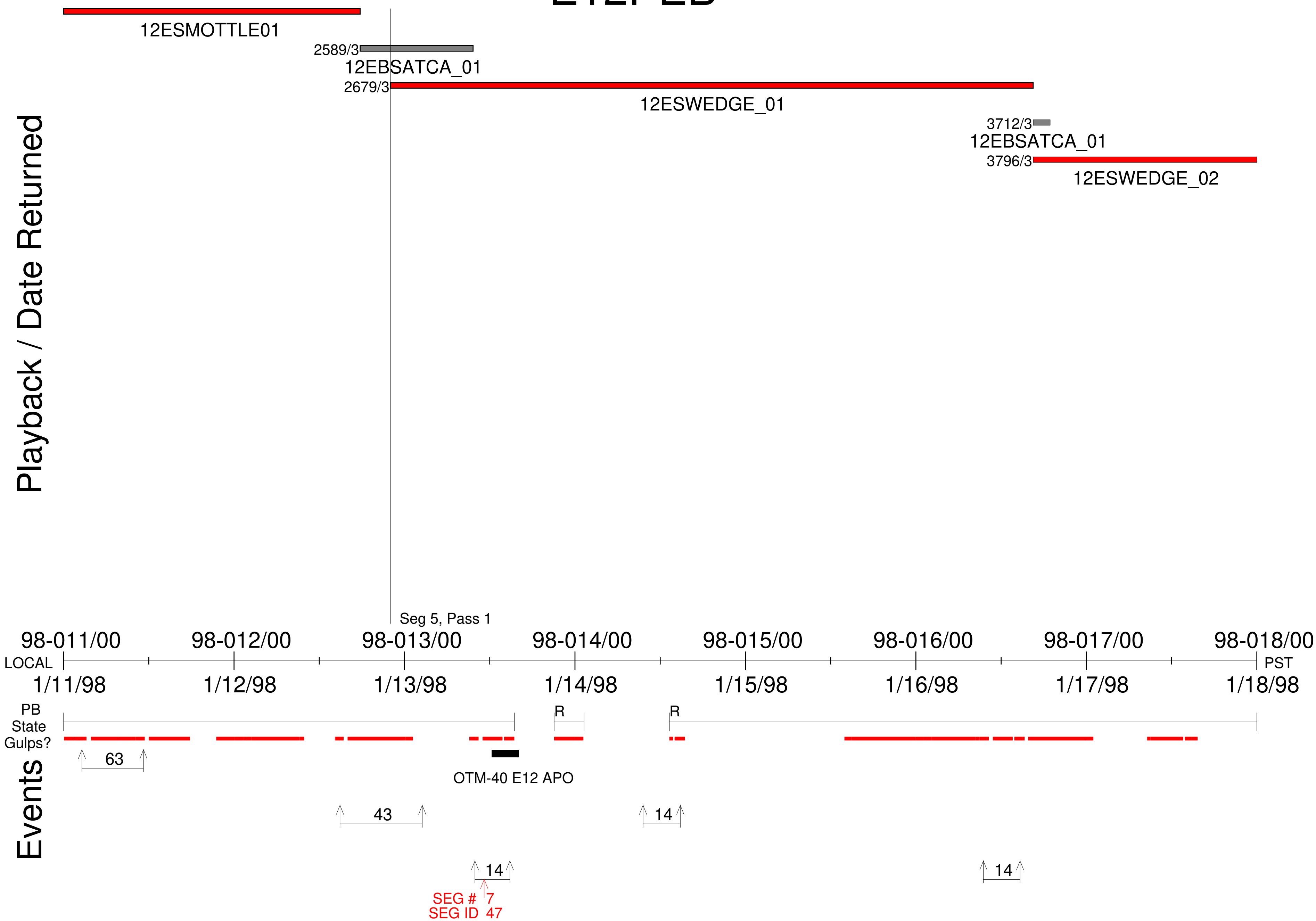

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E12PEB

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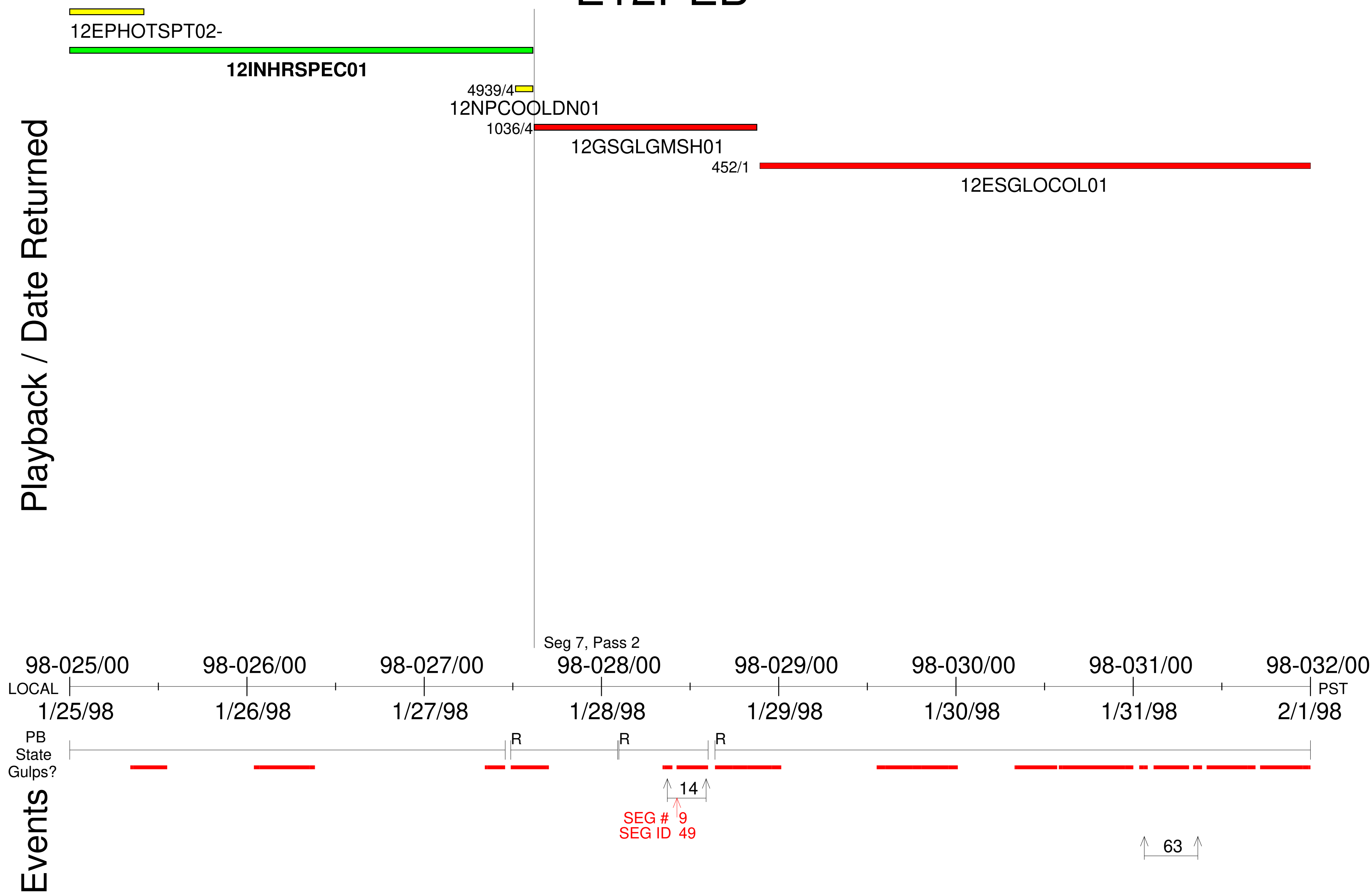

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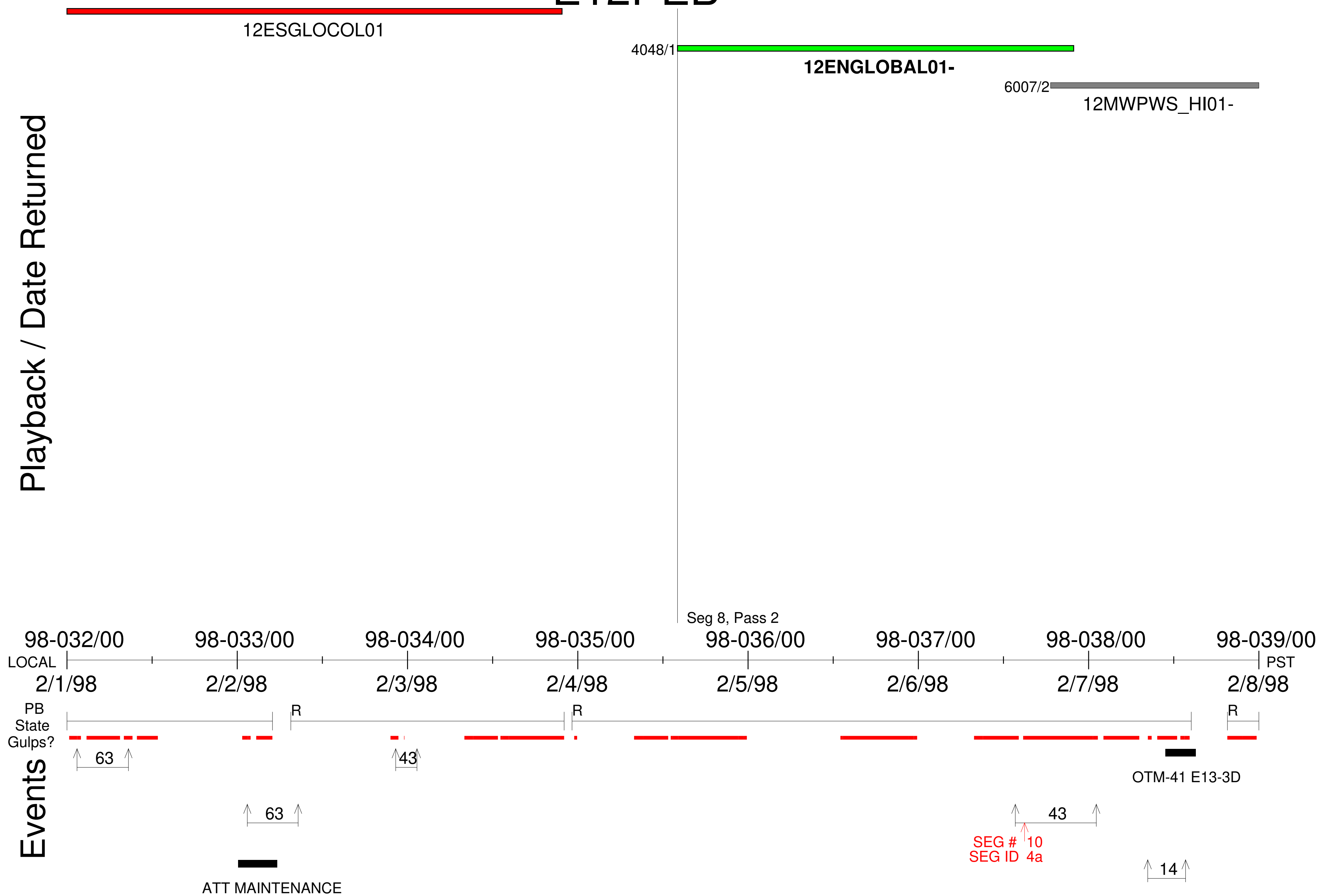

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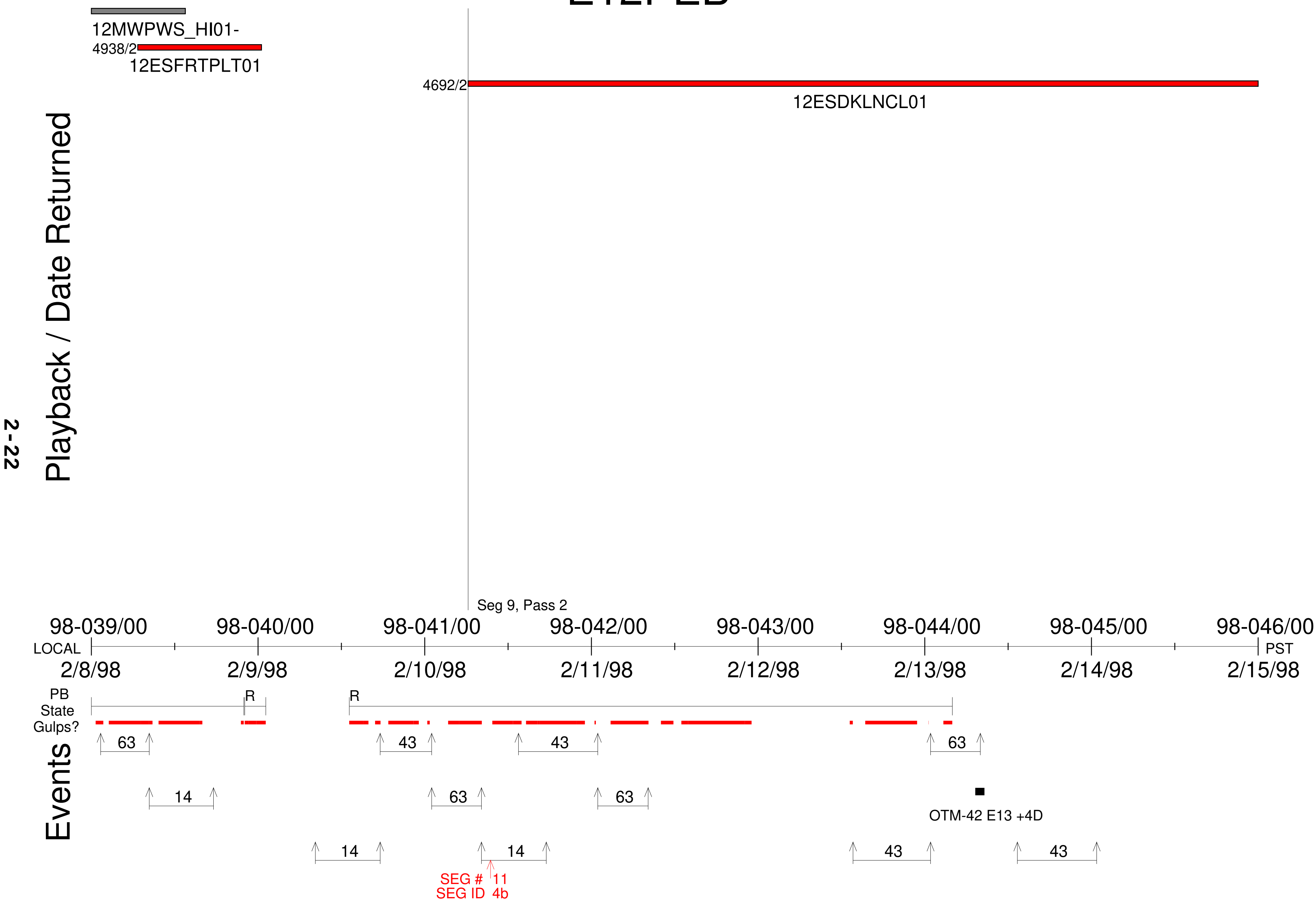

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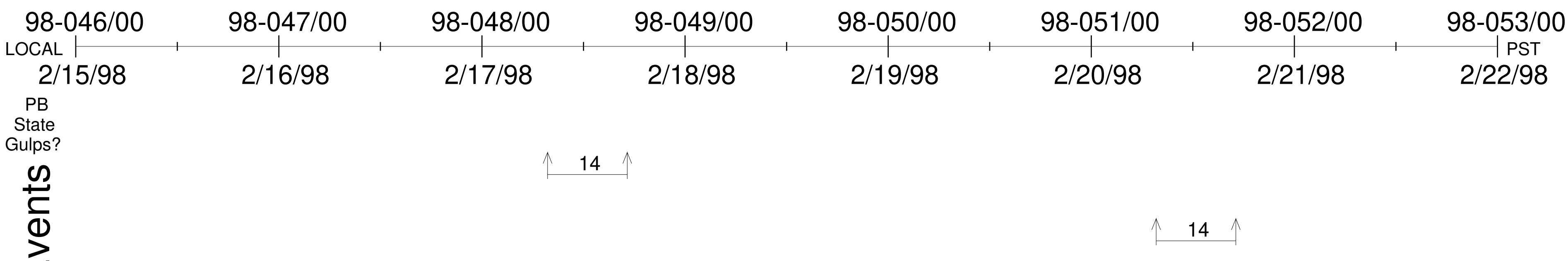
12ESDKLNCL01

Playback / Date Returned



Events

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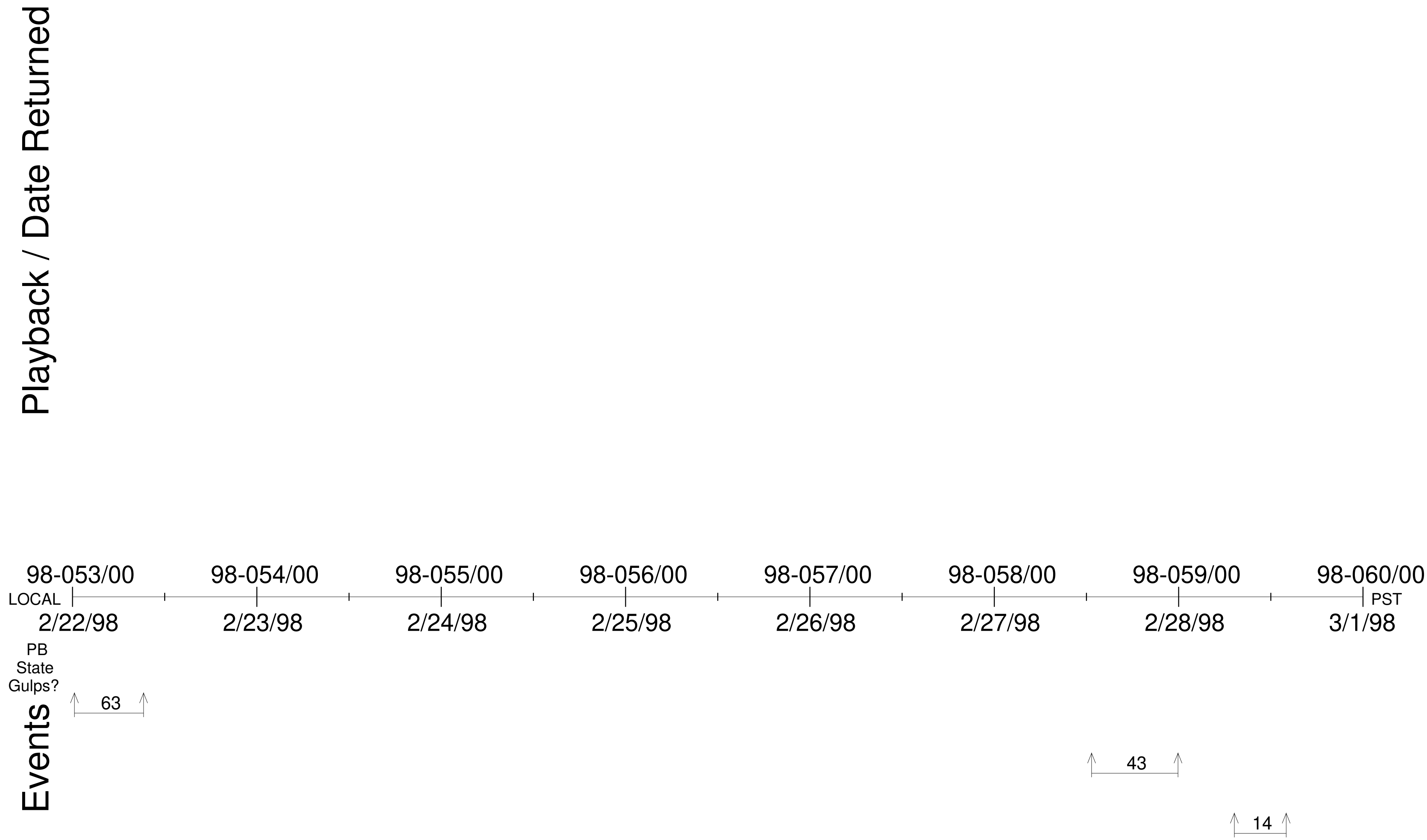

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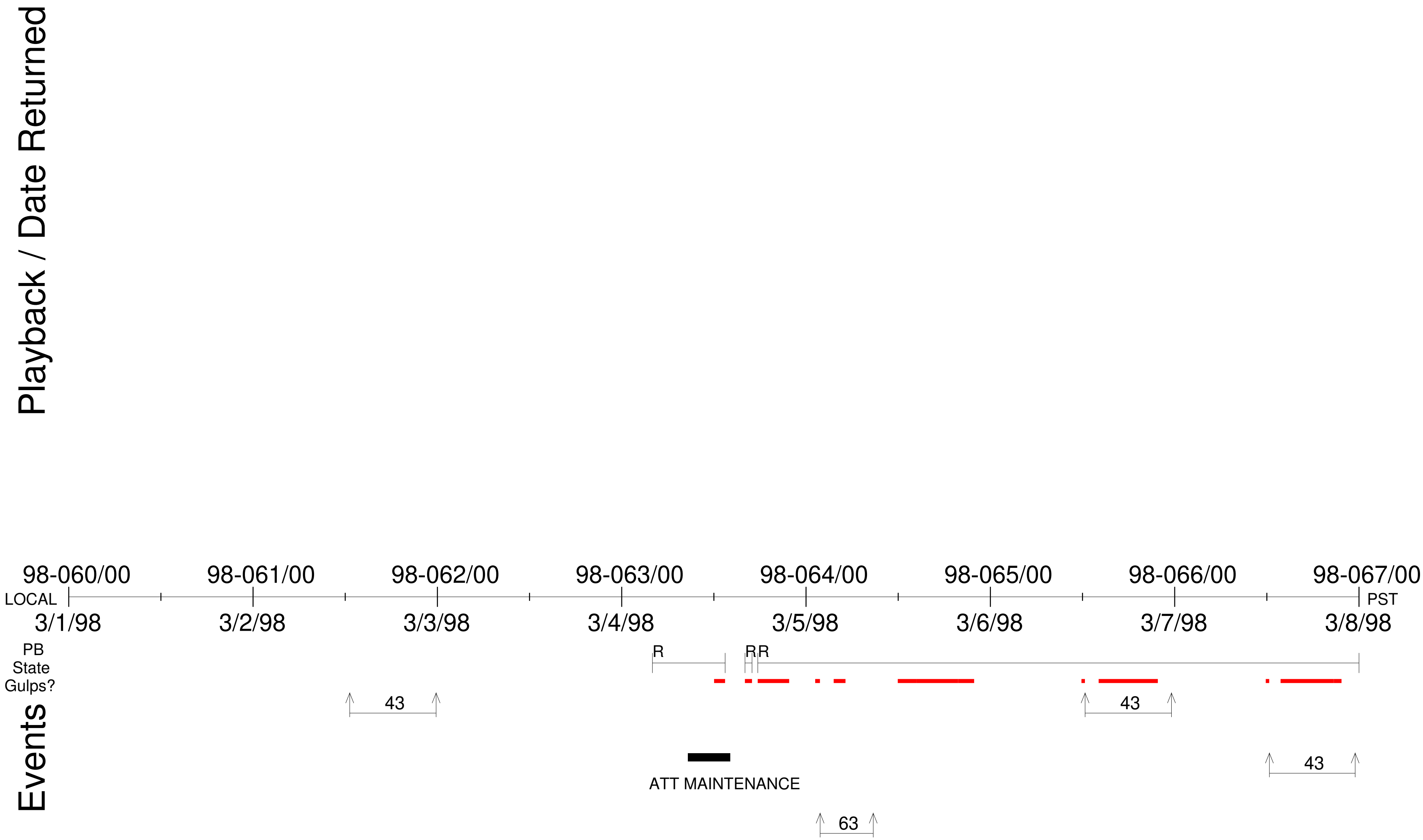

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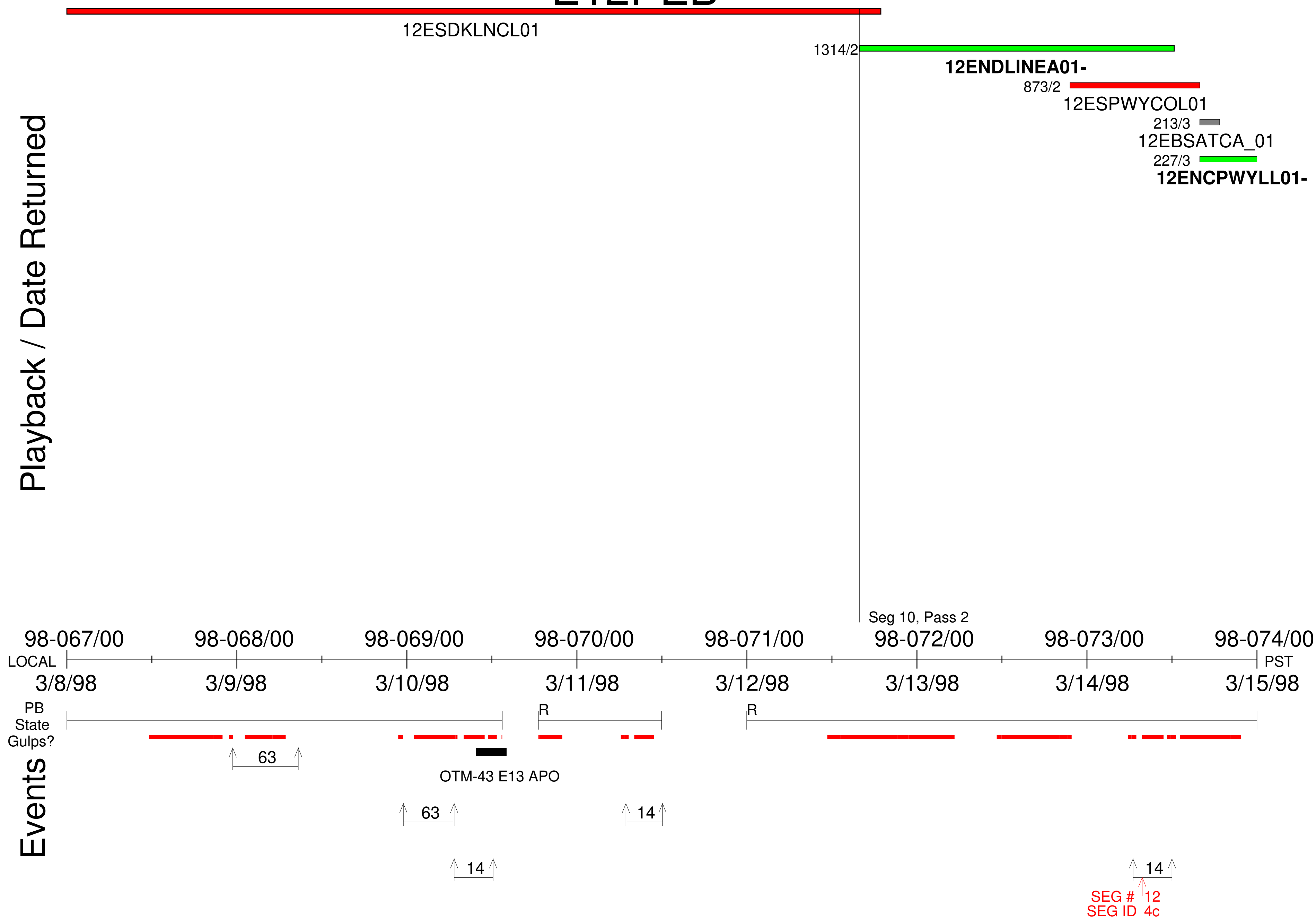

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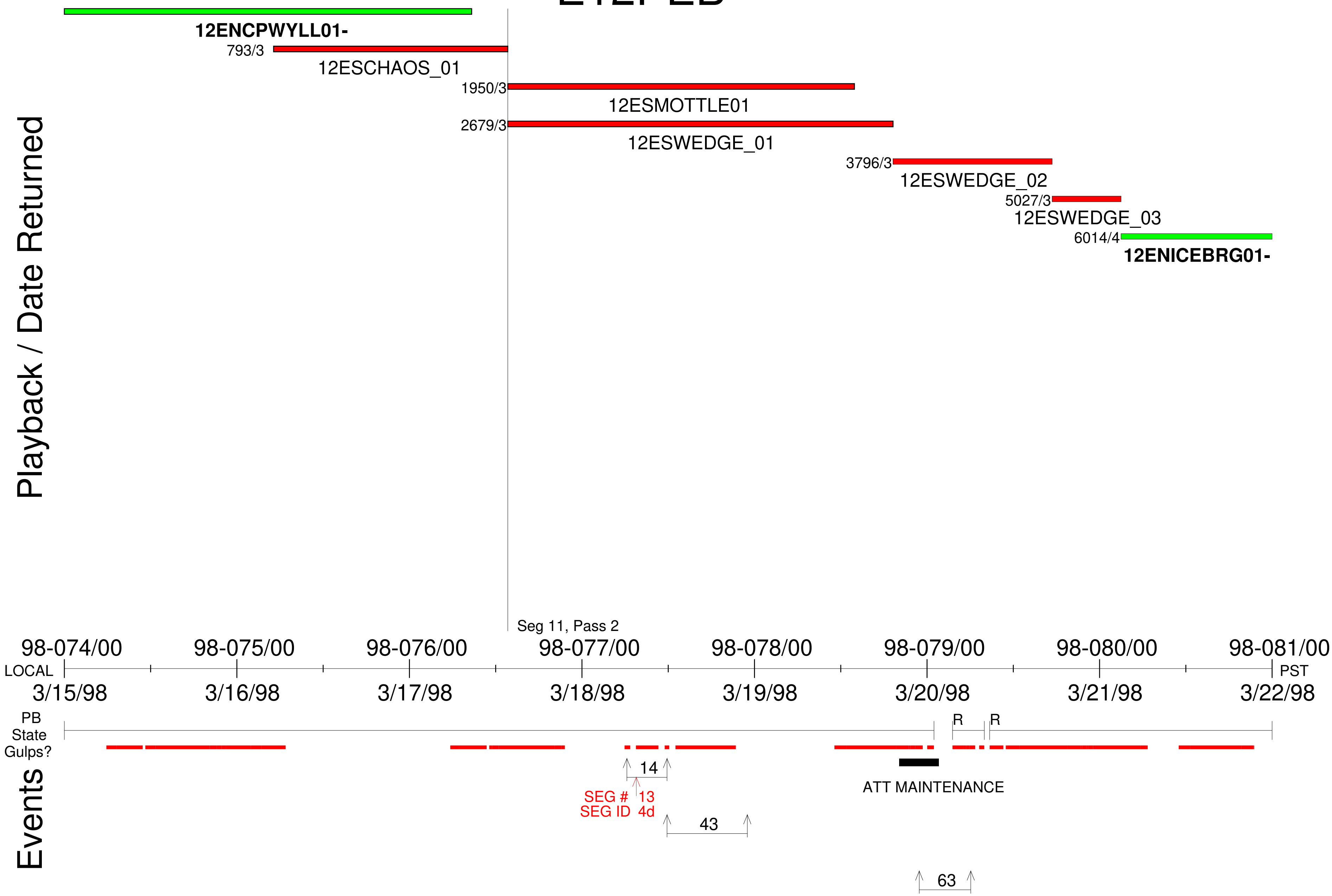

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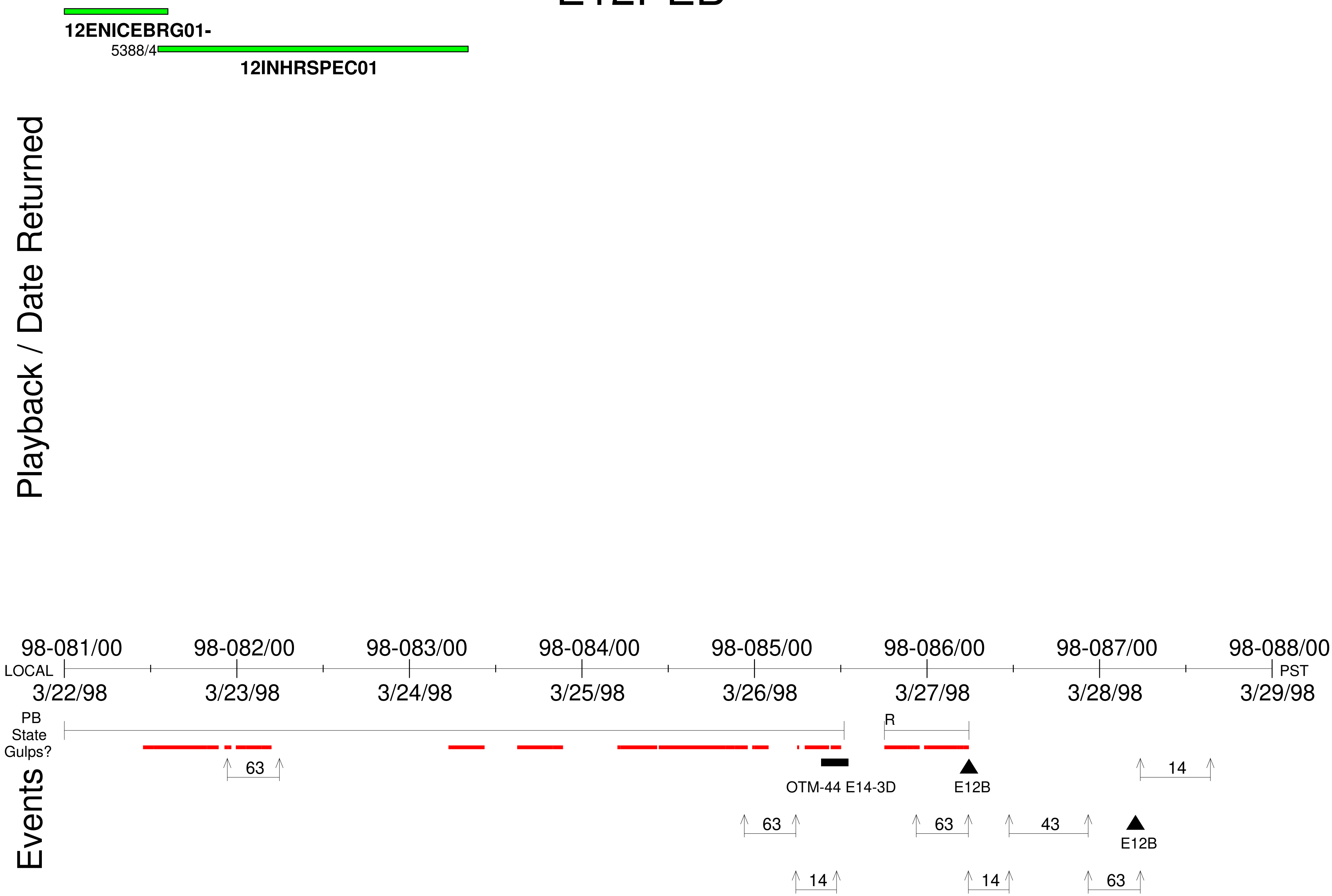

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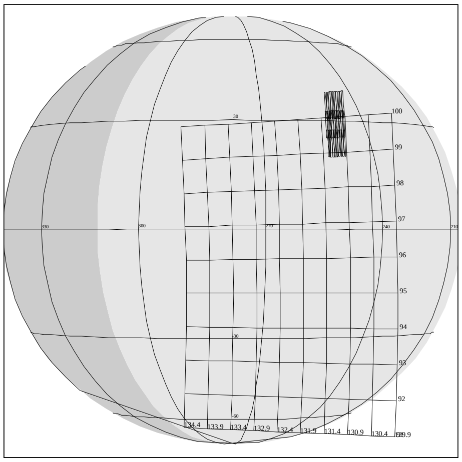
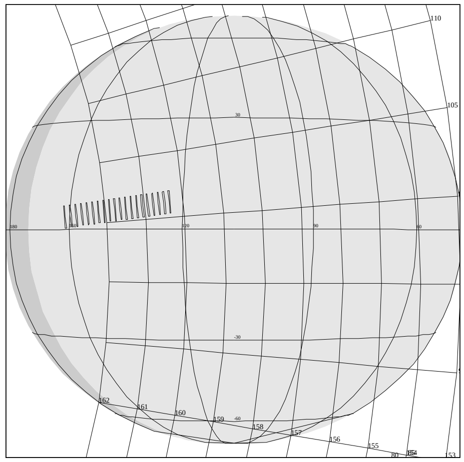
E12 NIMS A



12JNJUPRTS01
97-349/17:55:15



12JNJUPRTS02
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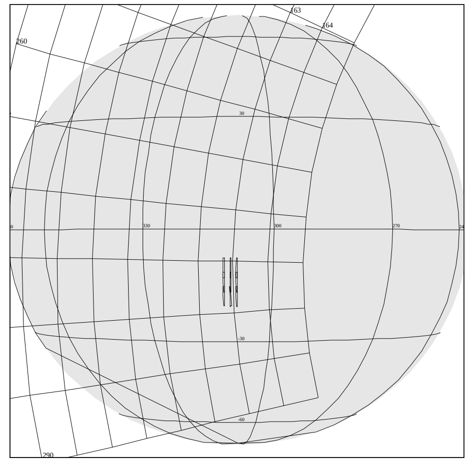

12JNJUPRTS03
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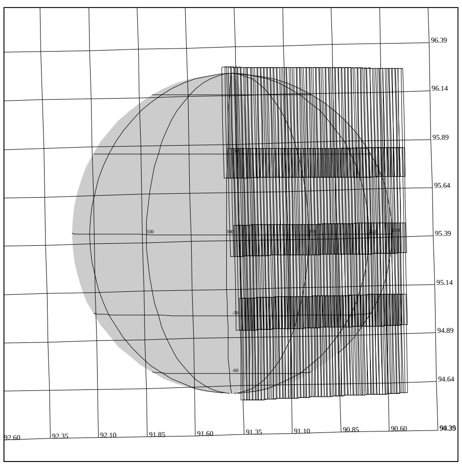

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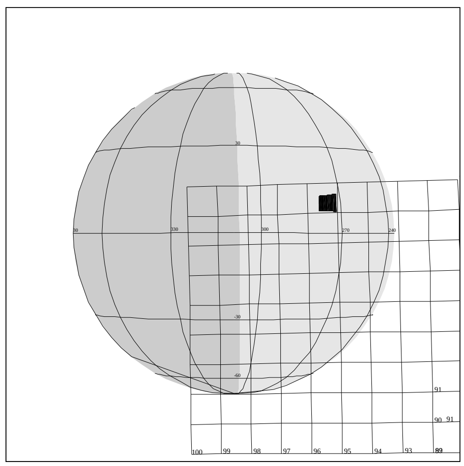

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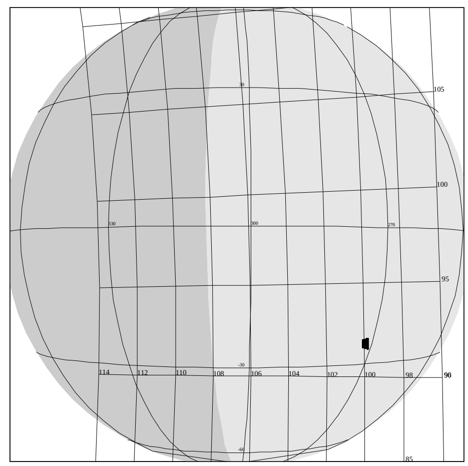

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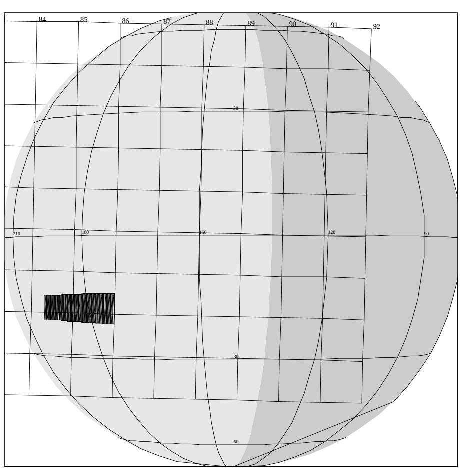

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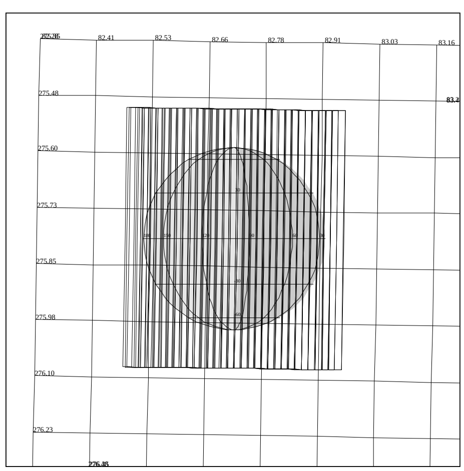

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