# Chapter 2 - Orbit Overview

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## Introduction to Chapter 2

This chapter gives an overview of the NIMS observations in the E17 Orbit.

The text on page 3 summarizes the NIMS science objectives for E17. The NIMS calibrations are discussed on page 3. Early data return and E17 playback are also discussed on page 3.

The table on page 4 is a time-ordered listing of the NIMS Oapels for E17.

The plot on page 5 shows the geometry of the NIMS E17 observations using a north trajectory pole view projection. The plot on page 6 shows the NIMS Europa regional observations along the trajectory of the E17 Europa flyby. The plot on page 7 shows the geometry of the NIMS E17 calibrations.

The table on page 8 lists various NIMS E17 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 E17 Observations. The spreadsheet on pages 10 and 11 summarizes the resource usage for the NIMS E17 observations.

The timeline on page 12 shows the placement of the E17 observations for all intruments during the E17 Encounter Period.

The tapemap on page 13 shows the placement of the E17 observations on the spacecraft’s tape recorder.

The timeline on pages 14 through 22 shows the preliminary E17 playback schedule.

The NIMS E17 mosaic designs are summarized on page 23 and 24 in time-order.

# NIMS E17 SCIENCE OVERVIEW

## Jupiter Science

There are six Jupiter observations in E17. Three are realtime and three are recorded. One of the realtime observations looks along the equator and the other two look at the daylit middle north latitude region. The three recorded observations look at the white oval region in the southern hemisphere near -30 latitude to investigate the newly created merged white ovals.

## Io Science

Io was not observed in E17.

## Europa Science

There are seven Europa observations planned for E17: Four regional observations, two half-disk global observation and one distant global observation. ENSUCOMP01 looks at 7N 225W, a region with strong non-ice material spectral features. ENSUCOMP02 is a long spectrometer mode observation that looks for non-water-ice material near -63S 120W. ENSUCOMP03 is a single swath in the leading-side southern hemisphere south of -60 latitude. ENSUCOMP04 looks for diffuse dark matierial near -30S 90W. ENGLOBAL01 covers pole to pole 120 to 220 degrees West longitude. ENGLOBAL02 covers pole to pole 70 to 160 degrees West longitude. ENEUR20H01 is a distant observation of Europa with two identical LPU scans across the half-lit disk. The first scan in gain state 4 with emphasis on longer wavelenghts. The second scan in gain state 3 with emphasis on shorter wavelenghts.

## Ganymede Science

Ganymede was not observed in E17.

## Callisto Science

Callisto was not observed in E17.

## Calibration

There are three NIMS calibration observations planned for E17: one RCT cal, one PCT cal and one OPCAL.

## Early Data Return

There are six realtime observations in E17: Three 408 wavelength Jupiter observations (JUPRTS), one RCT calibration, one PCT calibration and one OPCAL.

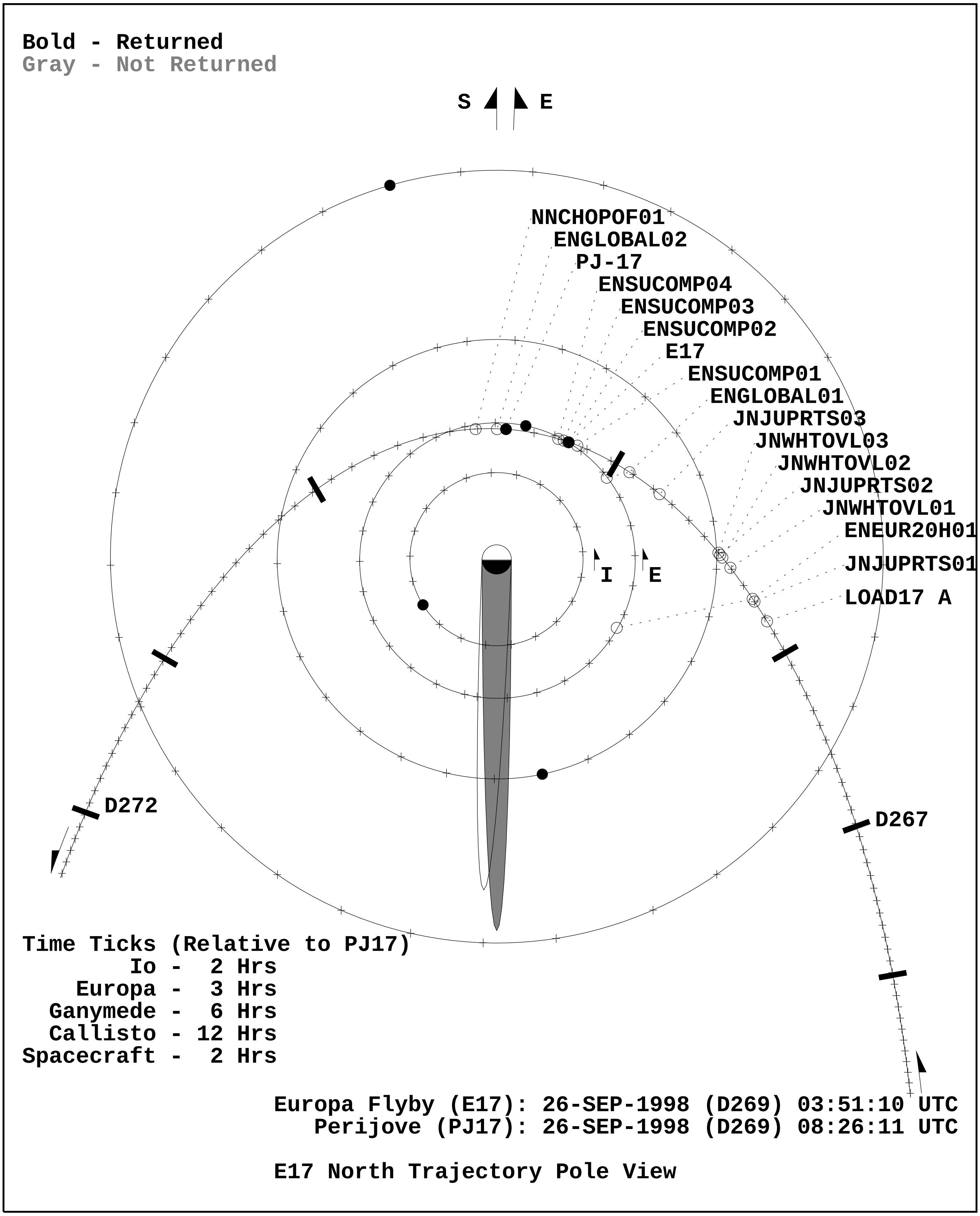
## E17 Playback

E17 playback is split into two passes through the tape.

## E17 Time-Ordered Listing

| OAPEL | Start (UTC) | End (UTC) | Duration |
|---|---|---|---|
| 17NNJUPRTS01- | 98-268/06:17:55 | 98-268/06:28:02 | 000/00:10:06 |
| 17JNJUPRTS01* | 98-268/06:28:02 | 98-268/06:42:11 | 000/00:14:09 |
| 17NNEUR20H01- | 98-268/06:44:12 | 98-268/06:48:15 | 000/00:04:02 |
| 17ENEUR20H01- | 98-268/06:48:15 | 98-268/07:02:24 | 000/00:14:09 |
| 17NNWHTOVL01- | 98-268/10:27:40 | 98-268/10:37:46 | 000/00:10:06 |
| 17JNWHTOVL01- | 98-268/10:37:46 | 98-268/10:50:55 | 000/00:13:08 |
| 17NNWHTOVL02- | 98-268/11:41:28 | 98-268/11:51:35 | 000/00:10:06 |
| 17JNWHTOVL02- | 98-268/11:51:35 | 98-268/12:05:44 | 000/00:14:09 |
| 17NNJUPRTS02- | 98-268/12:01:42 | 98-268/12:11:48 | 000/00:10:06 |
| 17JNJUPRTS02* | 98-268/12:11:48 | 98-268/12:25:58 | 000/00:14:09 |
| 17NNWHTOVL03- | 98-268/12:25:58 | 98-268/12:27:59 | 000/00:02:01 |
| 17JNWHTOVL03- | 98-268/12:27:59 | 98-268/12:42:08 | 000/00:14:09 |
| 17NNJUPRTS03- | 98-268/14:10:06 | 98-268/14:20:13 | 000/00:10:06 |
| 17JNJUPRTS03* | 98-268/14:20:13 | 98-268/14:35:23 | 000/00:15:10 |
| 17NNGLOBAL01- | 98-268/22:36:40 | 98-268/22:46:47 | 000/00:10:06 |
| 17ENGLOBAL01- | 98-268/22:46:47 | 98-268/23:37:20 | 000/00:50:33 |
| 17NNSUCOMP01- | 98-269/03:01:35 | 98-269/03:11:42 | 000/00:10:06 |
| 17ENSUCOMP01- | 98-269/03:11:42 | 98-269/03:35:58 | 000/00:24:16 |
| 17NNSUCOMP02- | 98-269/03:44:03 | 98-269/03:54:10 | 000/00:10:06 |
| 17ENSUCOMP02- | 98-269/03:54:10 | 98-269/04:11:21 | 000/00:17:11 |
| 17NNSUCOMP03- | 98-269/04:04:16 | 98-269/04:14:23 | 000/00:10:06 |
| 17ENSUCOMP03- | 98-269/04:14:23 | 98-269/04:37:38 | 000/00:23:15 |
| 17NNSUCOMP04- | 98-269/04:37:38 | 98-269/04:39:40 | 000/00:02:01 |
| 17ENSUCOMP04- | 98-269/04:39:40 | 98-269/04:50:47 | 000/00:11:07 |
| 17NNGLOBAL02- | 98-269/08:54:28 | 98-269/09:04:34 | 000/00:10:06 |
| 17ENGLOBAL02- | 98-269/09:04:34 | 98-269/09:34:54 | 000/00:30:20 |
| 17NNCHOPOF01- | 98-269/10:35:34 | 98-269/10:45:41 | 000/00:10:06 |
| 17NNPCTRLT01- | 98-278/15:00:24 | 98-278/22:50:34 | 000/07:50:10 |
| 17NNRCTRLT01- | 98-303/06:00:03 | 98-303/19:15:47 | 000/13:15:44 |

# NIMS E17 OBSERVATIONS

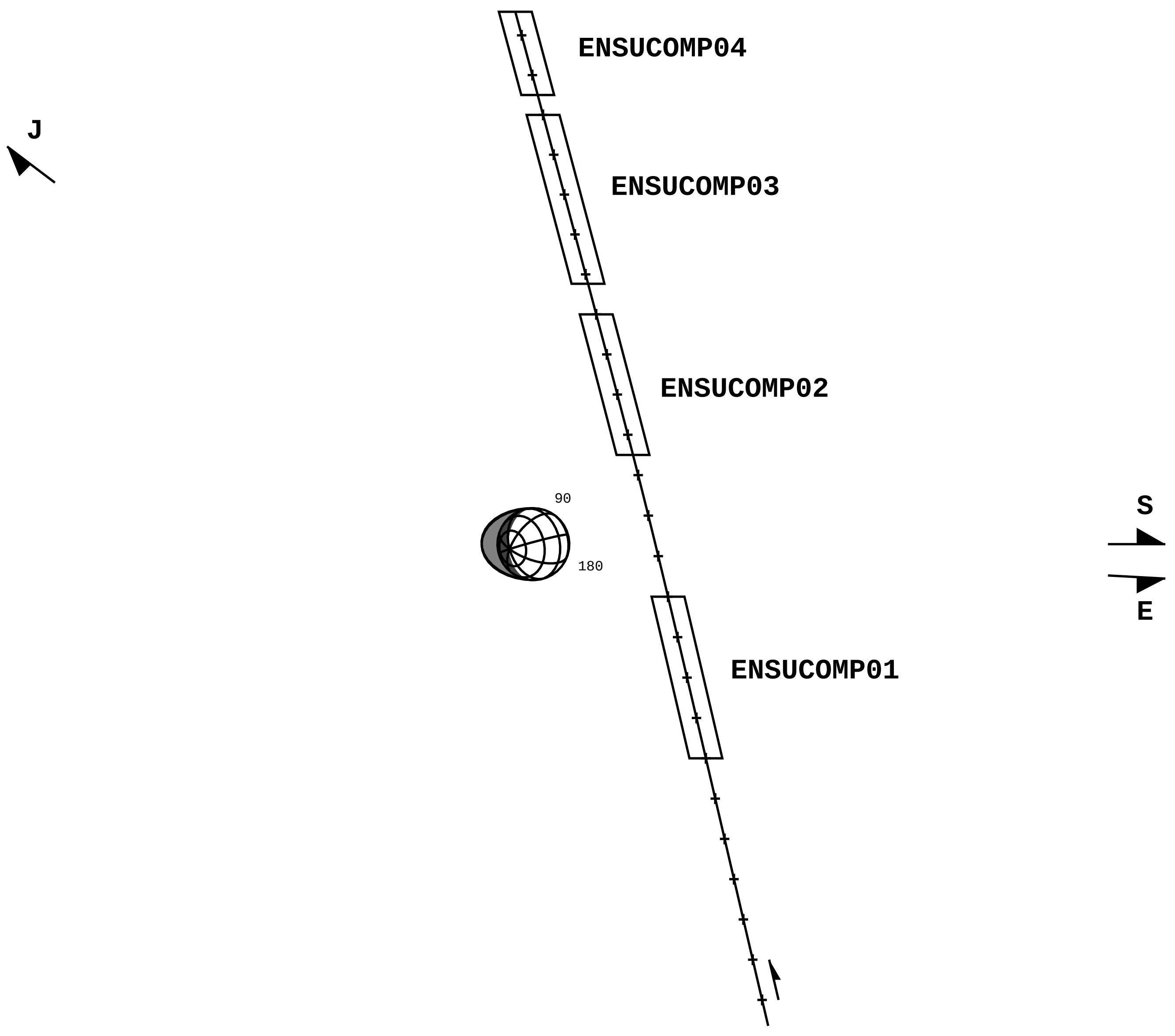



NIMS - FEL - 12/06/99

# NIMS E17 EUROPA FLYBY OBSERVATIONS

Europa Flyby (E17): 26-SEP-1998 (D269) 03:51:10 UTC

Time Ticks (Relative to E17)
Spacecraft - 5 Minutes

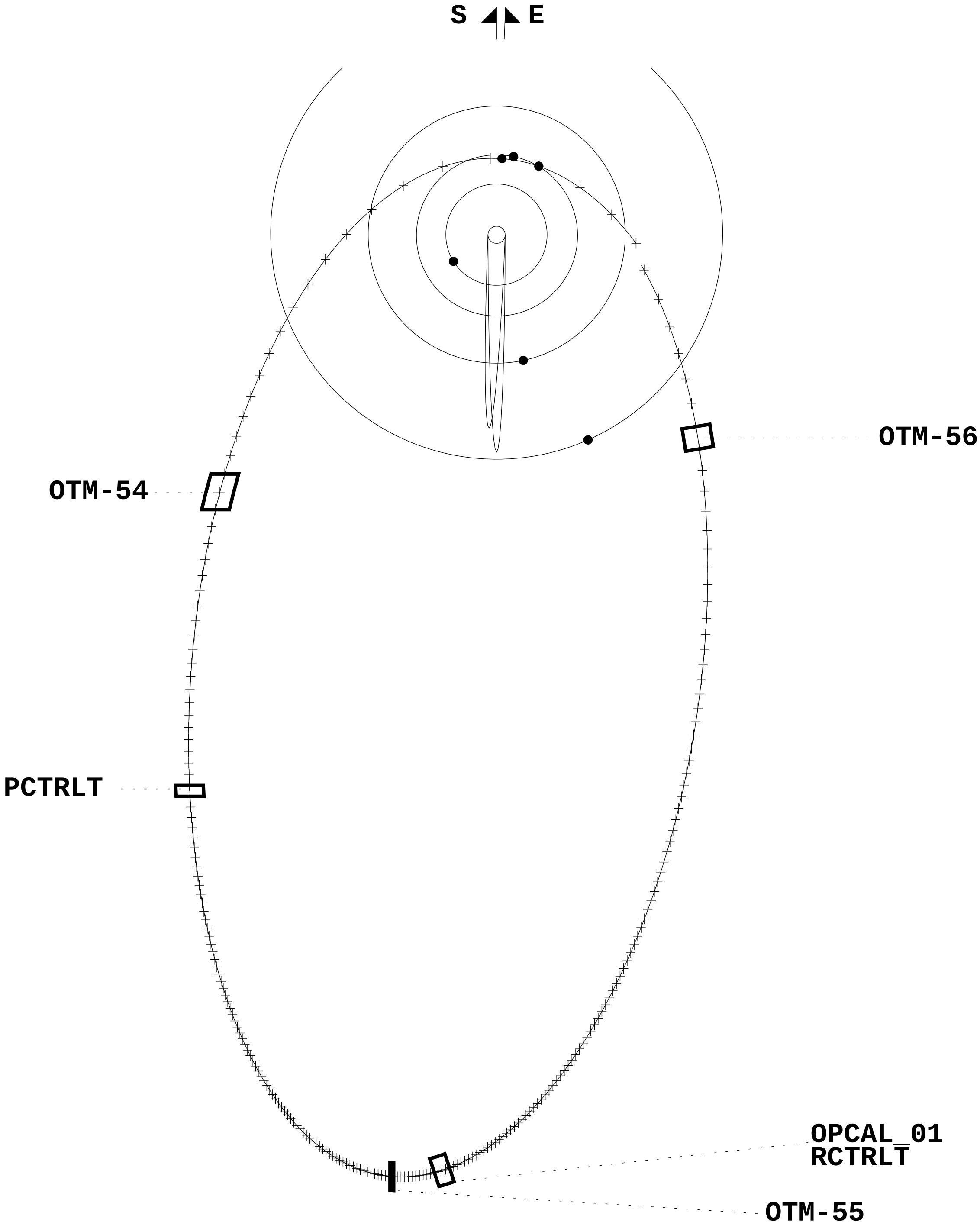



E17 North Trajectory Pole View, +/- 1 Hour

# NIMS E17 CRUISE CALIBRATIONS

Europa Flyby (E17): 26-SEP-1998 (D269) 03:51:10 UTC
Perijove (PJ17): 26-SEP-1998 (D269) 08:26:11 UTC
Apojove (AJ17): 24-OCT-1998 (D297) 16:00:00 UTC

Time Ticks (Relative to E17)
Spacecraft - 6 Hours




E17 North Trajectory Pole View, Perijove to Perijove

NIMS E17 OBSERVING GEOMETRY

| OAPEL | Latitude (deg) | Longitude (deg) | Range (km) | Cone (deg) | Light (deg) | View (deg) | Phase (deg) |
|---|---|---|---|---|---|---|---|
| 17JNJUPRTS01 | +10 to +40 | 107 to 131 | 1220K | 84 | 57 to 73 | 32 to 61 | 100 |
| 17ENEUR20H01 | -90 to +90 | 60 to 230 | 666K | 107 | 6 to 167 | 0 to 90 | 77 |
| 17JNWHTOVL01 | -35 to -25 | 334 to 23 | 1106K | 95 | 119 to 152 | 44 to 90 | 89 |
| 17JNWHTOVL02 | -35 to -25 | 344 to 08 | 1030K | 96 | 89 to 115 | 31 to 43 | 89 |
| 17JNJUPRTS02 | -05 to +05 | 313 to 348 | 1020K | 95 | 51 to 80 | 9 to 40 | 90 |
| 17JNWHTOVL03 | -35 to -25 | 343 to 06 | 1015K | 96 | 70 to 95 | 31 to 38 | 88 |
| 17JNJUPRTS03 | +25 to +45 | 38 to 55 | 962K | 100 | 66 to 74 | 32 to 54 | 85 |
| 17ENGLOBAL01 | -90 to +90 | 120 to 230 | 100K | 107 | 11 to 97 | 10 to 90 | 77 |
| 17ENSUCOMP01 | +06 to +15 | 226 to 233 | 6.3 to 11.6K | 122 to 132 | 76 to 84 | 37 to 65 | 50 to 62 |
| 17ENSUCOMP02 | +63 | 113 to 128 | 4.2 to 8.6K | 97 to 126 | 67 to 72 | 35 to 58 | 50 to 79 |
| 17ENSUCOMP03 | -70 to -60 | 69 to 151 | 10 to 17K | 87 to 92 | 62 to 90 | 61 to 76 | 83 to 88 |
| 17ENSUCOMP04 | -40 to -30 | 73 to 91 | 17 to 21K | 83 to 86 | 70 to 83 | 30 to 39 | 89 to 92 |
| 17ENGLOBAL02 | -90 to +90 | 74 to 164 | 116K | 75 | 18 to 97 | 15 to 90 | 101 |

# E17 NIMS INPUTS

| Activity ID | Observation Title | NIMS Edit Table | NIMS PB Table | Mode | Gain | Grating Start | Grating Offset | Record Format | PSID |
|---|---|---|---|---|---|---|---|---|---|
| 17NNJUPRTS01- | NIMS Software Reload | | | | | | | | |
| 17JNJUPRTS01* | Jupiter Realtime Observation | E17JLM408/MB | R/T | LM | 2 | 0 | 4 | R/T | DA |
| 17NNEUR20H01- | NIMS Software Reload | | | | | | | | |
| 17ENEUR20H01 | Europa 20 Hour Map | E17B_ELM240T | E17B_ELM240T | LM | 4 | 0 | 4 | LPU | EA |
| 17ENEUR20H01 | Europa 20 Hour Map | E17B_ELM240V | E17B_ELM168V | LM | 3 | 0 | 4 | LPU | EA |
| 17NNWHTOVL01- | NIMS Software Reload | | | | | | | | |
| 17JNWHTOVL01- | Jupiter White Oval | E17JSB253B | E17JSB253B | LM | 4 | 0 | 4 | LPU | EB |
| 17NNWHTOVL02- | NIMS Software Reload | | | | | | | | |
| 17JNWHTOVL02- | Jupiter White Oval | E17JSB253B | E17JSB253B | LM | 4 | 0 | 4 | LPU | EC |
| 17NNJUPRTS02- | NIMS Software Reload | | | | | | | | |
| 17JNJUPRTS02* | Jupiter Realtime Observation | E17JLM408/MB | R/T | LM | 2 | 0 | 4 | R/T | DB |
| 17NNWHTOVL03- | NIMS Software Reload | | | | | | | | |
| 17JNWHTOVL03- | Jupiter White Oval | E17JSB253B | E17JSB253B | LM | 2 | 0 | 4 | LPU | ED |
| 17NNJUPRTS03- | NIMS Software Reload | | | | | | | | |
| 17JNJUPRTS03* | Jupiter Realtime Observation | E17JLM408/MB | R/T | LM | 2 | 0 | 4 | R/T | DC |
| 17NNGLOBAL01- | NIMS Software Reload | | | | | | | | |
| 17ENGLOBAL01- | Europa Global Observation | E17ELM442 | E17B_ELM228C_1 | LM | 3 | 0 | 4 | MPW | DD |
| 17NNSUCOMP01- | NIMS Software Reload | | | | | | | | |
| 17ENSUCOMP01- | Europa Surface Composition | E17ELM442 | E17ELM360 | LM | 4 | 0 | 4 | MPW | DE |
| 17NNSUCOMP02- | NIMS Software Reload | | | | | | | | |
| 17ENSUCOMP02- | Europa Surface Composition | E17ELM442 | E17ELM360 | LS | 4 | 0 | 4 | MPW | DF |
| 17NNSUCOMP03- | NIMS Software Reload | | | | | | | | |
| 17ENSUCOMP03- | Europa Surface Composition | E17ELM442 | E17ELM360 | LM | 4 | 0 | 4 | MPW | DG |
| 17NNSUCOMP04- | NIMS Software Reload | | | | | | | | |
| 17ENSUCOMP04- | Europa Surface Composition | E17ELM442 | E17ELM360 | LM | 4 | 0 | 4 | MPW | DH |
| 17NNGLOBAL02- | NIMS Software Reload | | | | | | | | |
| 17ENGLOBAL02- | Europa Global Observation | E17ELM442 | E17B_ELM228C_1 | LM | 4,3,4 | 0 | 4 | MPW | DI |
| 17NNCHOPOF01- | NIMS Chopper off | | | | | | | | DN |
| 17NNPCTRLT01- | NIMS Real-Time PCT Claibration | E17PCT252 | R/T | LM | 4 | 0 | 4 | R/T | FB |
| 17NNRCTRLT01- | NIMS RCT Real-Time Calibration | E17RCT252 | R/T | LM | 1 | 0 | 4 | R/T | XE |
| 17NNOPCAL_01- | NIMS OPCAL | E17OPCAL48 | R/T | LM | 4 | 0 | 4 | R/T | DC |

# E17 RESOURCES

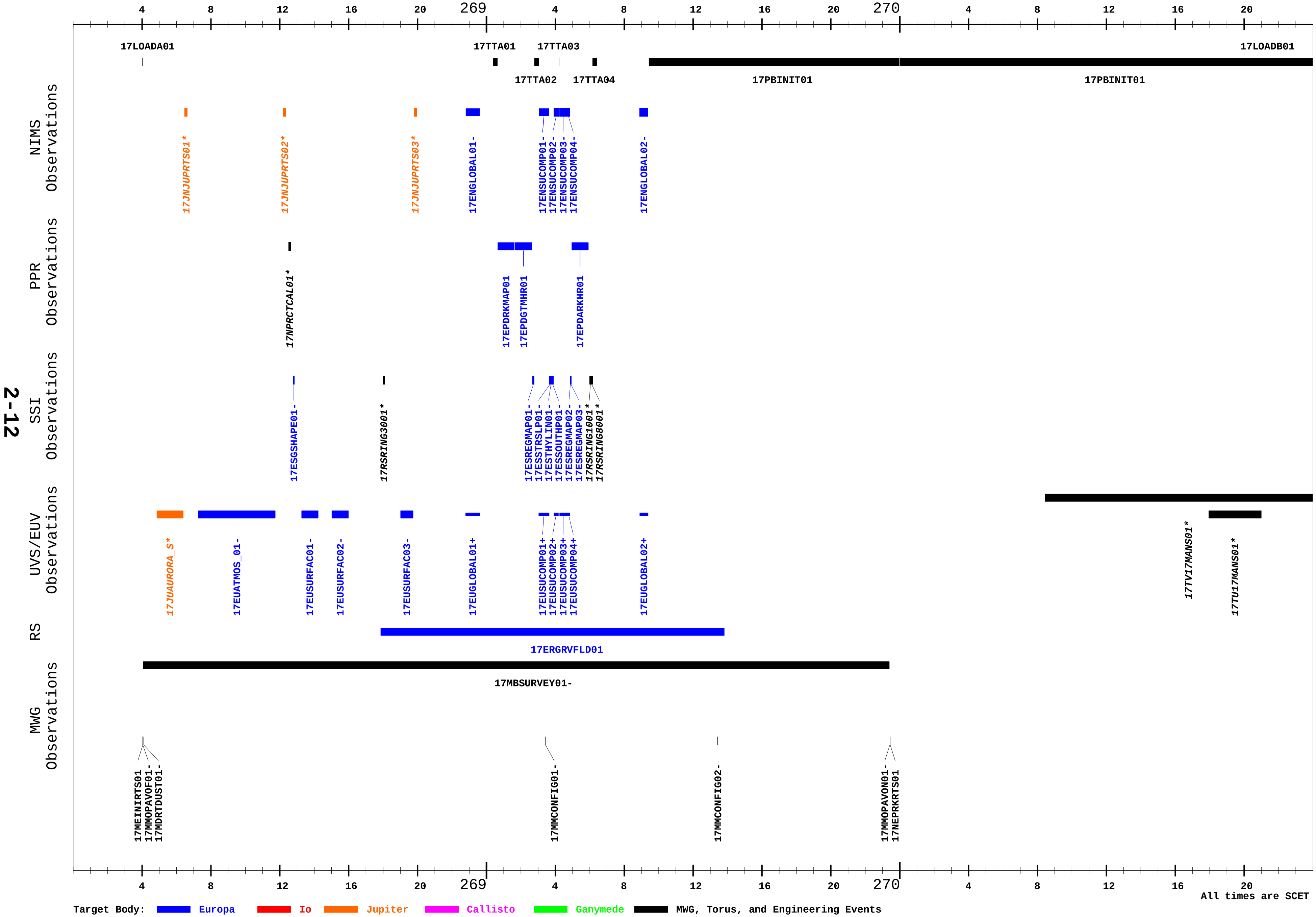
| Activity ID | Mode | Record Mode | Obs. Cost (tracks) | Obs. Cost (ticks) | Number Wavelengths Returned | Obs Record (sec.) | Obs PB (sec.) | Selected Bits to Tape sBOT (MBITS) | Bits to Tape MBOT (Mbit) | Mode Cycle time (sec) |
|---|---|---|---|---|---|---|---|---|---|---|
| 17JNJUPRTS01 | LM | R/T | | | 360 | | | | | |
| 17ENEUR20H01 | LM | LPU | 0.0092 | 53 | 240 | | | | | |
| 17ENEUR20H01 | LM | LPU | 0.0092 | 53 | 168 | | | | | |
| 17JNWHTOVL01 | LM | LPU | | | 253 | | | | | |
| 17JNWHTOVL02 | LM | LPU | 0.0246 | 143 | 253 | | | | | |
| 17JNJUPRTS02 | LM | R/T | | | 360 | | | | | |
| 17JNWHTOVL03 | LM | LPU | 0.0246 | 143 | 253 | | | | | |
| 17JNJUPRTS03 | LM | R/T | | | 360 | | | | | |
| 17ENGLOBAL01 | LM | MPW | 0.4077 | 2376 | 228 | 2700 | 2700 | 31.10 | 31.10 | 8.667 |
| 17ENSUCOMP01 | LM | MPW | 0.1814 | 1057 | 360 | 1200 | 1200 | 13.82 | 13.82 | 8.667 |
| 17ENSUCOMP02 | LM | MPW | 0.1543 | 899 | 360 | 1020 | 1020 | 11.75 | 11.75 | 8.667 |
| 17ENSUCOMP03 | LM | MPW | 0.1995 | 1163 | 360 | 1320 | 1320 | 15.21 | 15.21 | 8.667 |
| 17ENSUCOMP04 | LM | MPW | 0.0909 | 530 | 360 | 600 | 600 | 6.91 | 6.91 | 8.667 |
| 17ENGLOBAL02 | LM | MPW | 0.2719 | 1585 | 228 | 1800 | 1800 | 20.74 | 20.74 | 8.667 |
| 17NNRCTRLT01 | LM | R/T | | | | | | | | |
| 17NNPCTRLT01 | LM | R/T | | | | | | | | |
| **Total Resources** | | | **1.3058** | **7609** | | | | | | |

# E17 RESOURCES

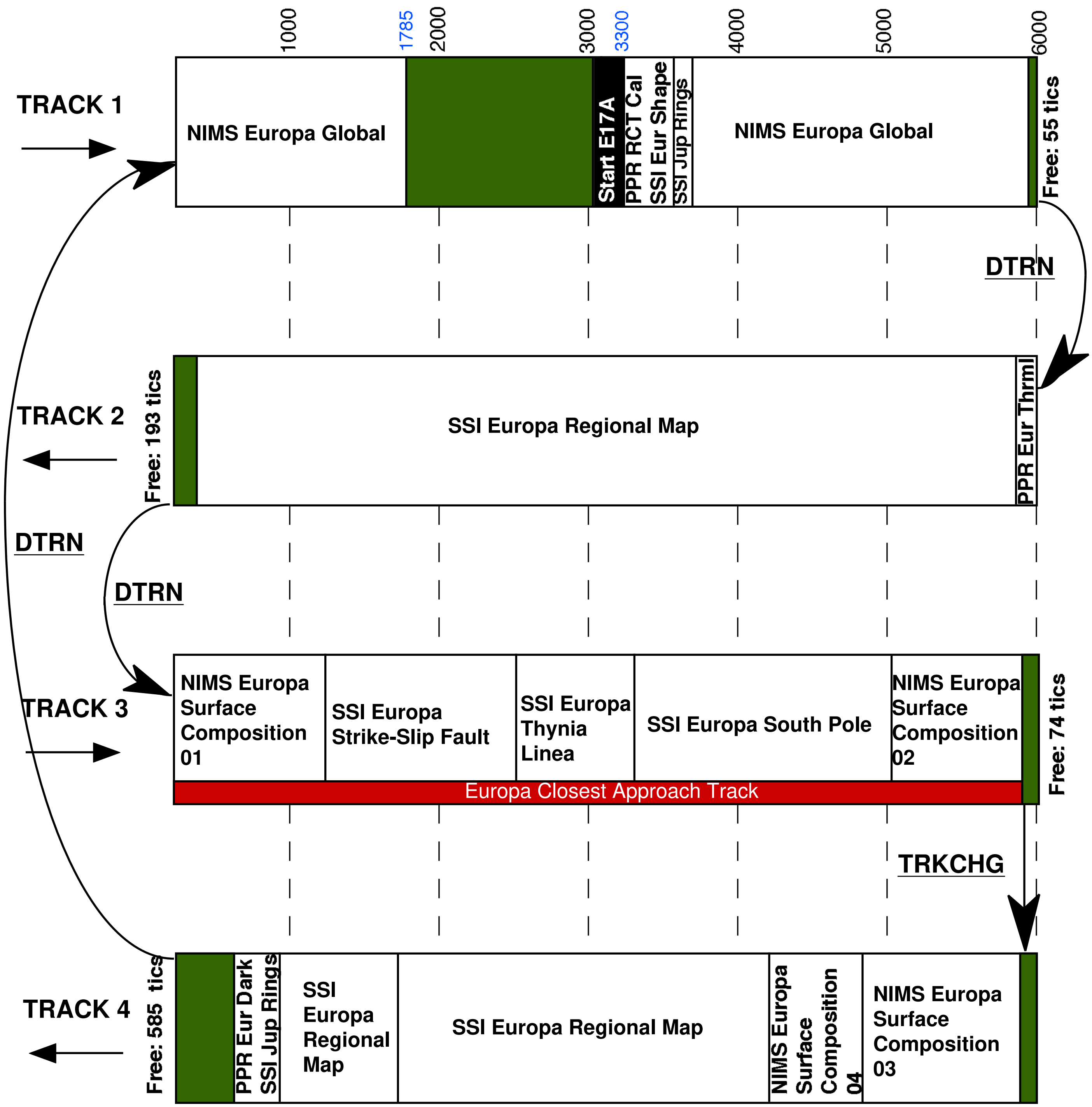
| Activity ID | AACS Mbits c 2.5 | Comp | Thold | RT BTG Mbits | Total BTG Mbits (w/4% overhead) | Data Reduction Factor (sBOT/BTG) | Pass |
|---|---|---|---|---|---|---|---|
| 17JNJUPRTS01 | | | | 0.16 | | | |
| 17ENEUR20H01 | | | | | | | |
| 17ENEUR20H01 | | | | | | | |
| 17JNWHTOVL01 | | | | | | | |
| 17JNWHTOVL02 | | | | | | | |
| 17JNJUPRTS02 | | | | 0.16 | | | |
| 17JNWHTOVL03 | | | | | | | |
| 17JNJUPRTS03 | | | | 0.16 | | | |
| 17ENGLOBAL01 | 0.16 | 1.5 | | | 9.8492 | 3.2 | |
| 17ENSUCOMP01 | 0.07 | 1.3 | | | 7.9751 | 1.7 | |
| 17ENSUCOMP02 | 0.06 | 1.3 | | | 6.7788 | 1.7 | |
| 17ENSUCOMP03 | 0.08 | 1.3 | | | 8.7726 | 1.7 | |
| 17ENSUCOMP04 | 0.03 | 1.3 | | | 3.9875 | 1.7 | |
| 17ENGLOBAL02 | 0.10 | 1.5 | | | 6.5661 | 3.2 | |
| 17NNRCTRLT01 | | | | | 0.1400 | | |
| 17NNPCTRLT01 | | | | | 0.2000 | | |
| | | | | | | | |
| **Total Resources** | | | | | **44.2694** | | |
| **Allocation** | | | | | | | |
| **Over/Under** | | | | | | | |

E17 ENCOUNTER
Plot Time: 98-268/00:00:00.000 to 98-271/00:00:00.000
Date of Plot: 17-Sep-97 8:27:38

GEM OPG: E17

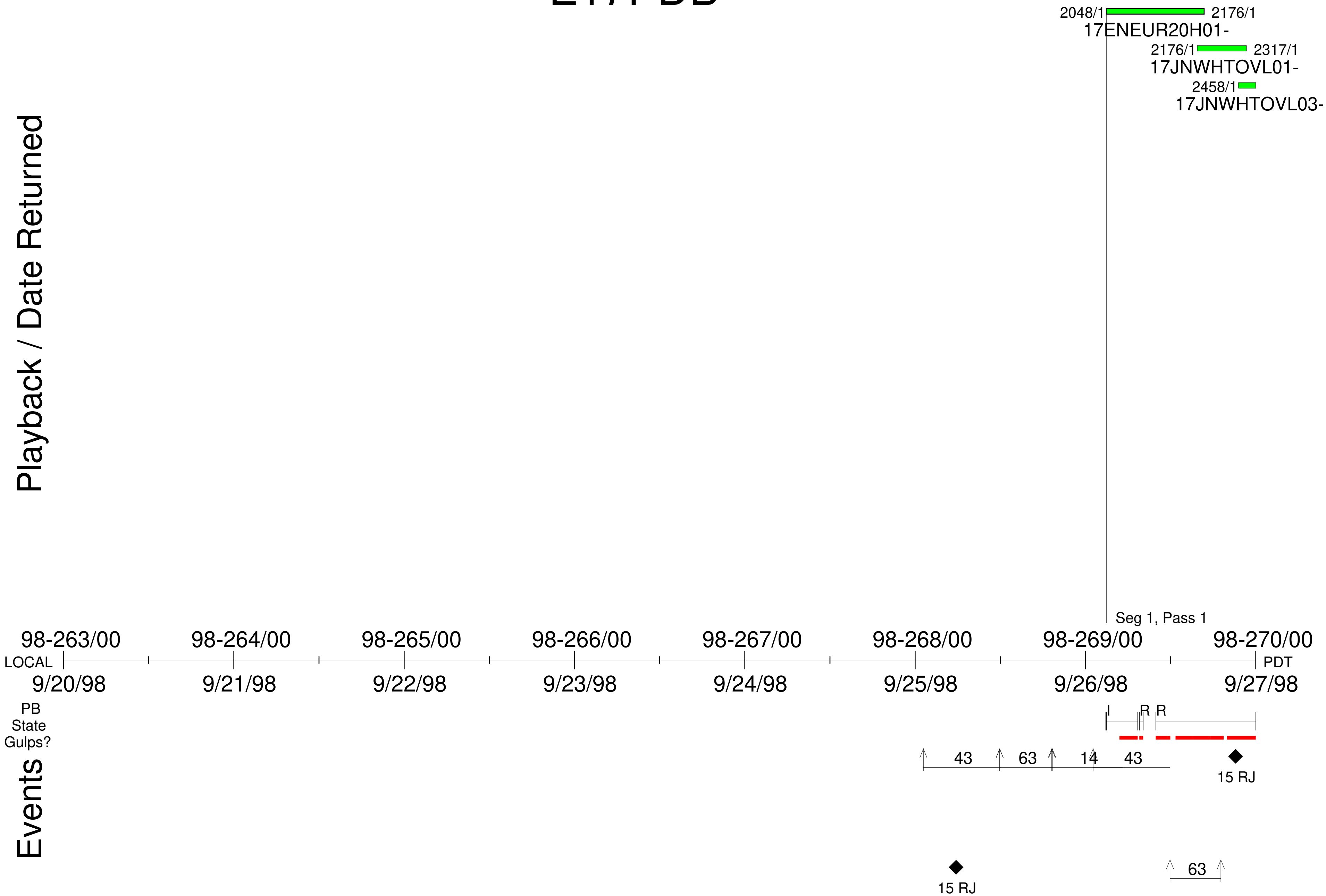


# E17 HIGH-LEVEL TAPEMAP




J. Gross, 8/13/97

# E17PDB




ORPROs Loaded: orpro.e17afc orpro.e17bfb

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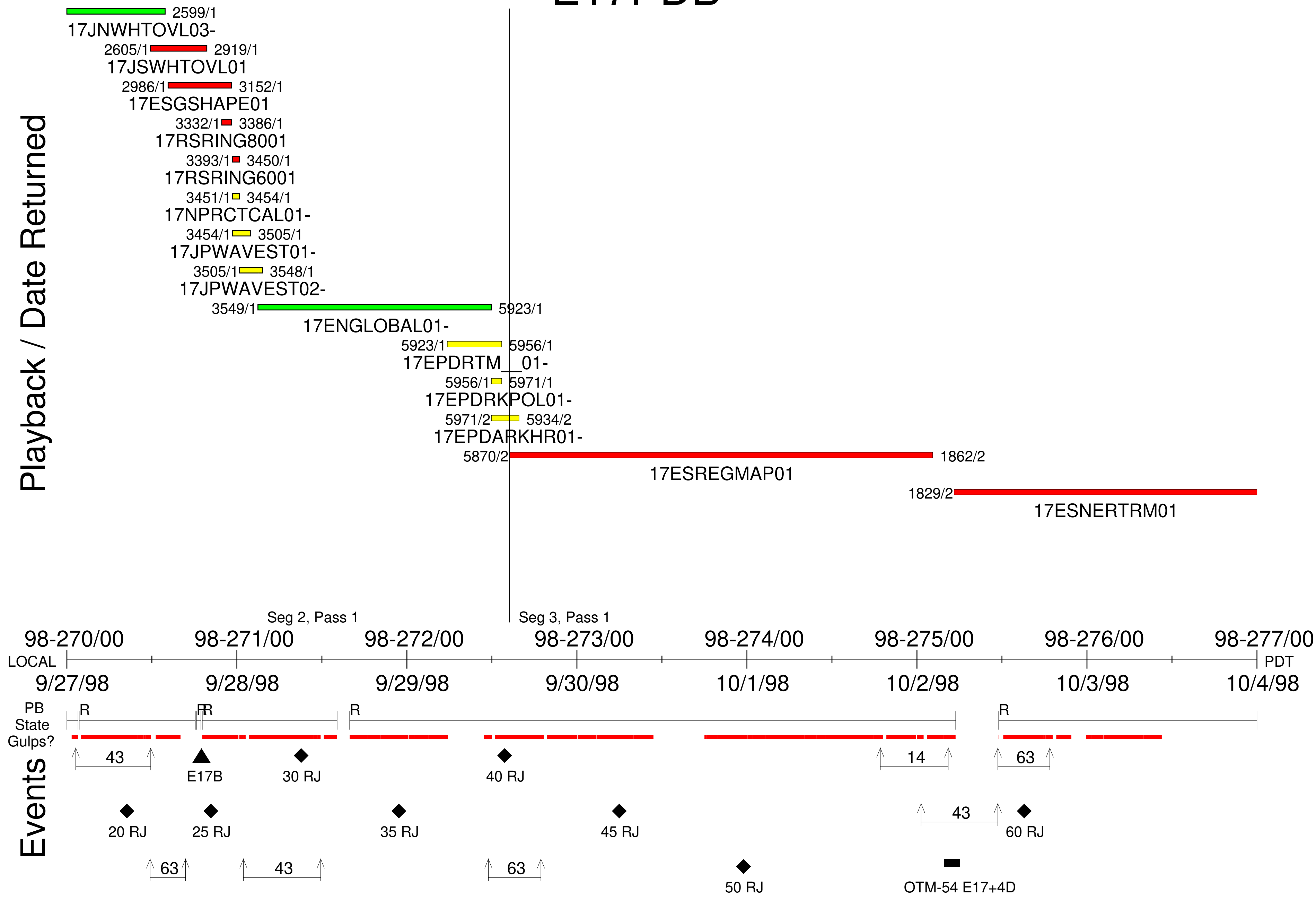
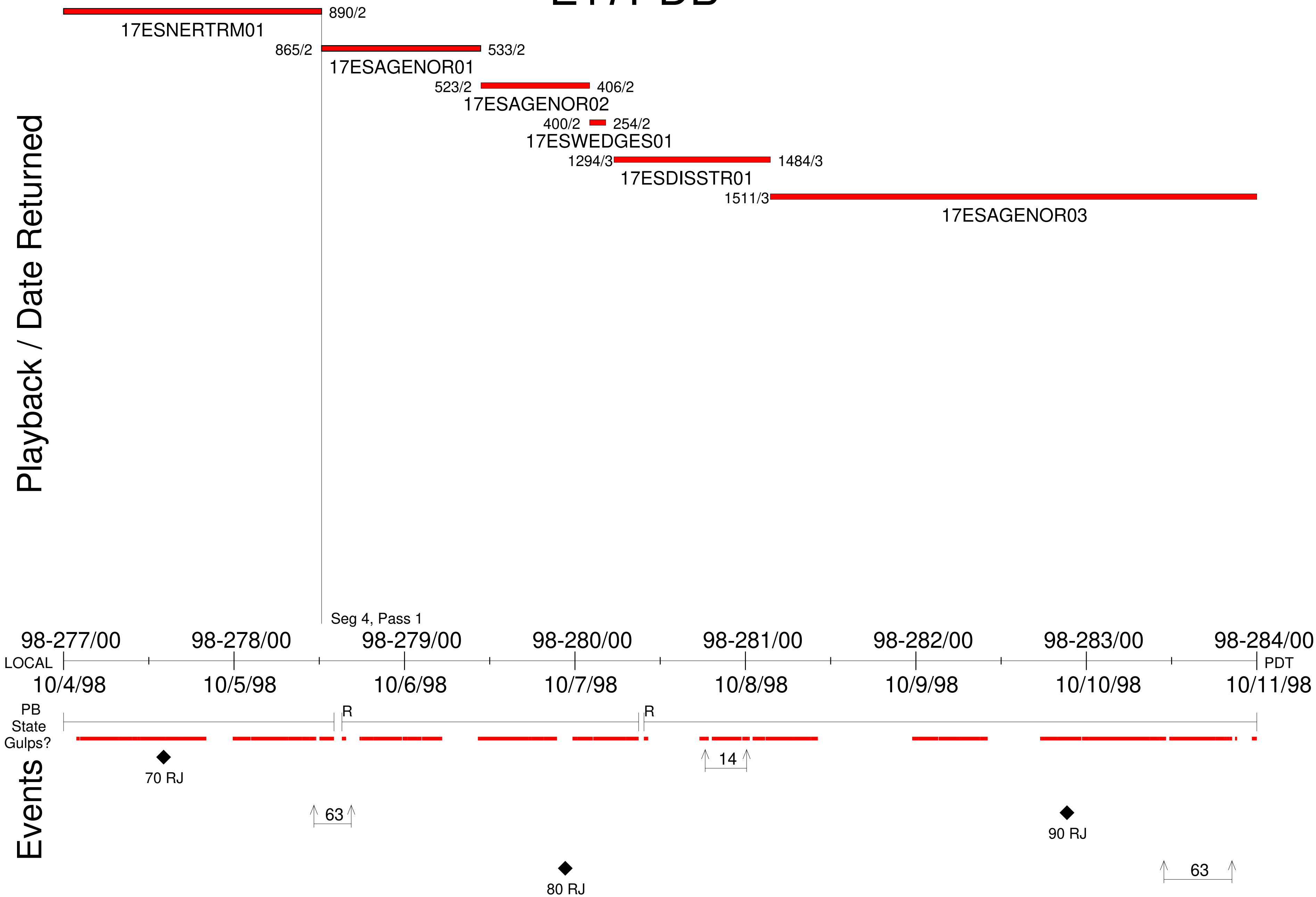
# E17PDB



Playback / Date Returned
2599/1
17JNWHTOVL03-
2605/1 2919/1
17JSWHTOVL01
2986/1 3152/1
17ESGSHAPE01
3332/1 3386/1
17RSRING8001
3393/1 3450/1
17RSRING6001
3451/1 3454/1
17NPRCTCAL01-
3454/1 3505/1
17JPWAVEST01-
3505/1 3548/1
17JPWAVEST02-
3549/1 5923/1
17ENGLOBAL01-
5923/1 5956/1
17EPDRTM__01-
5956/1 5971/1
17EPDRKPOL01-
5971/2 5934/2
17EPDARKHR01-
5870/2 1862/2
17ESREGMAP01
1829/2
17ESNERTRM01
Seg 2, Pass 1
Seg 3, Pass 1
98-270/00
98-271/00
98-272/00
98-273/00
98-274/00
98-275/00
98-276/00
98-277/00
LOCAL
PDT
9/27/98
9/28/98
9/29/98
9/30/98
10/1/98
10/2/98
10/3/98
10/4/98
PB State
Gulps?
R
RR
R
R
Events
43
E17B
30 RJ
40 RJ
14
63
20 RJ
25 RJ
35 RJ
45 RJ
43
60 RJ
63
43
63
50 RJ
OTM-54 E17+4D

# E17PDB




ORPROs Loaded: orpro.e17afc orpro.e17bfb

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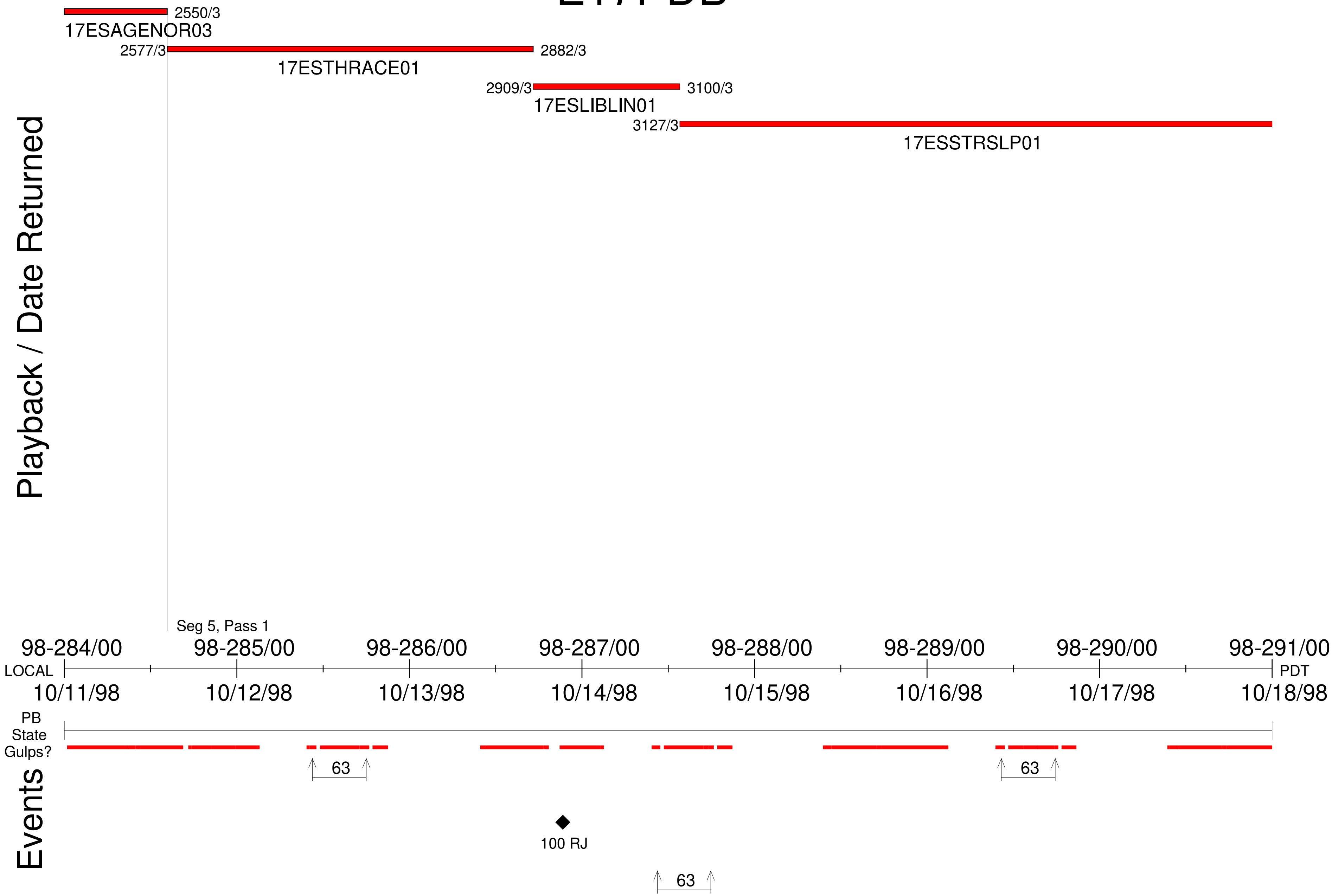
# E17PDB




ORPROs Loaded: orpro.e17afc orpro.e17bfb

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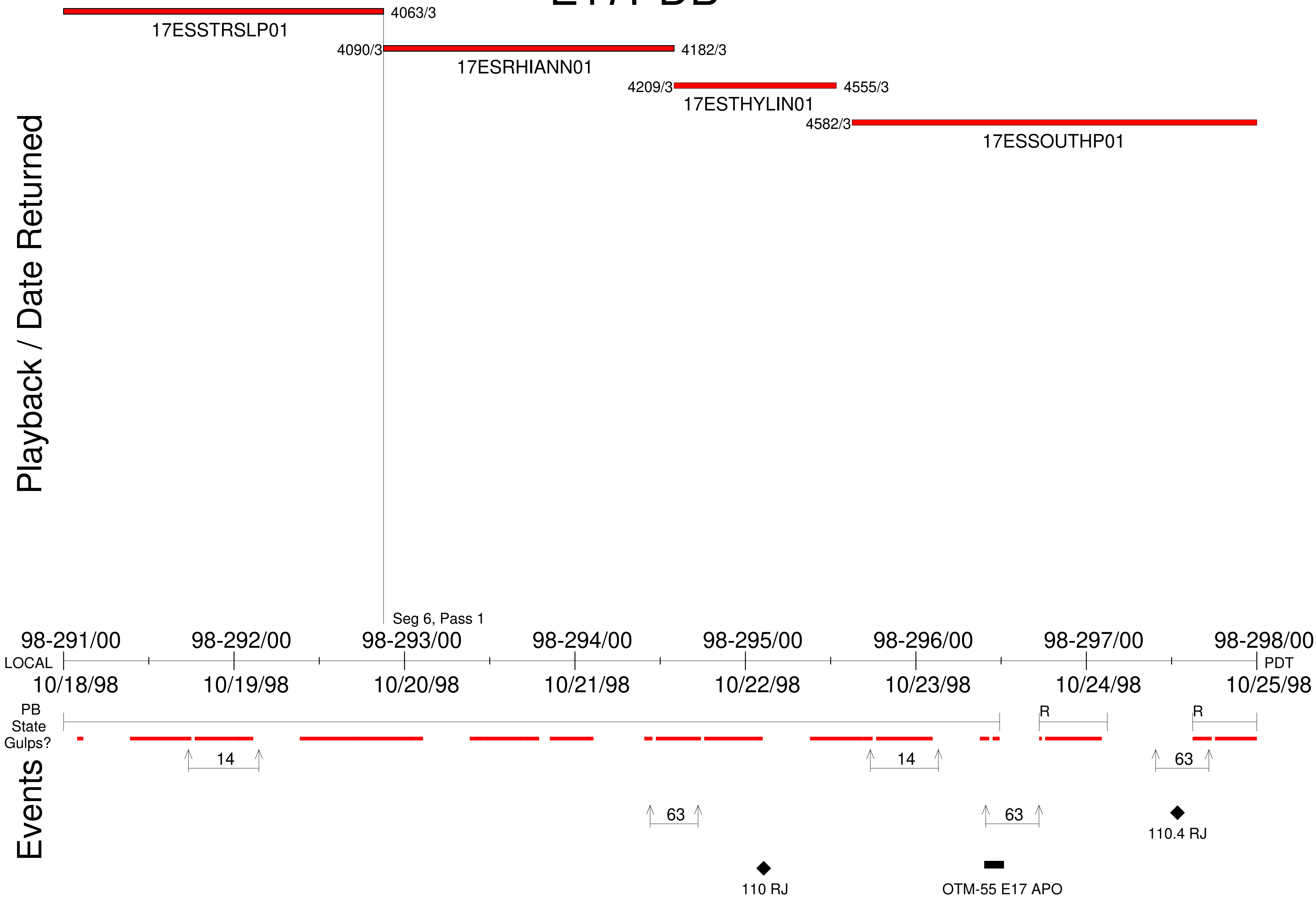
# E17PDB




ORPROs Loaded: orpro.e17afc orpro.e17bfb

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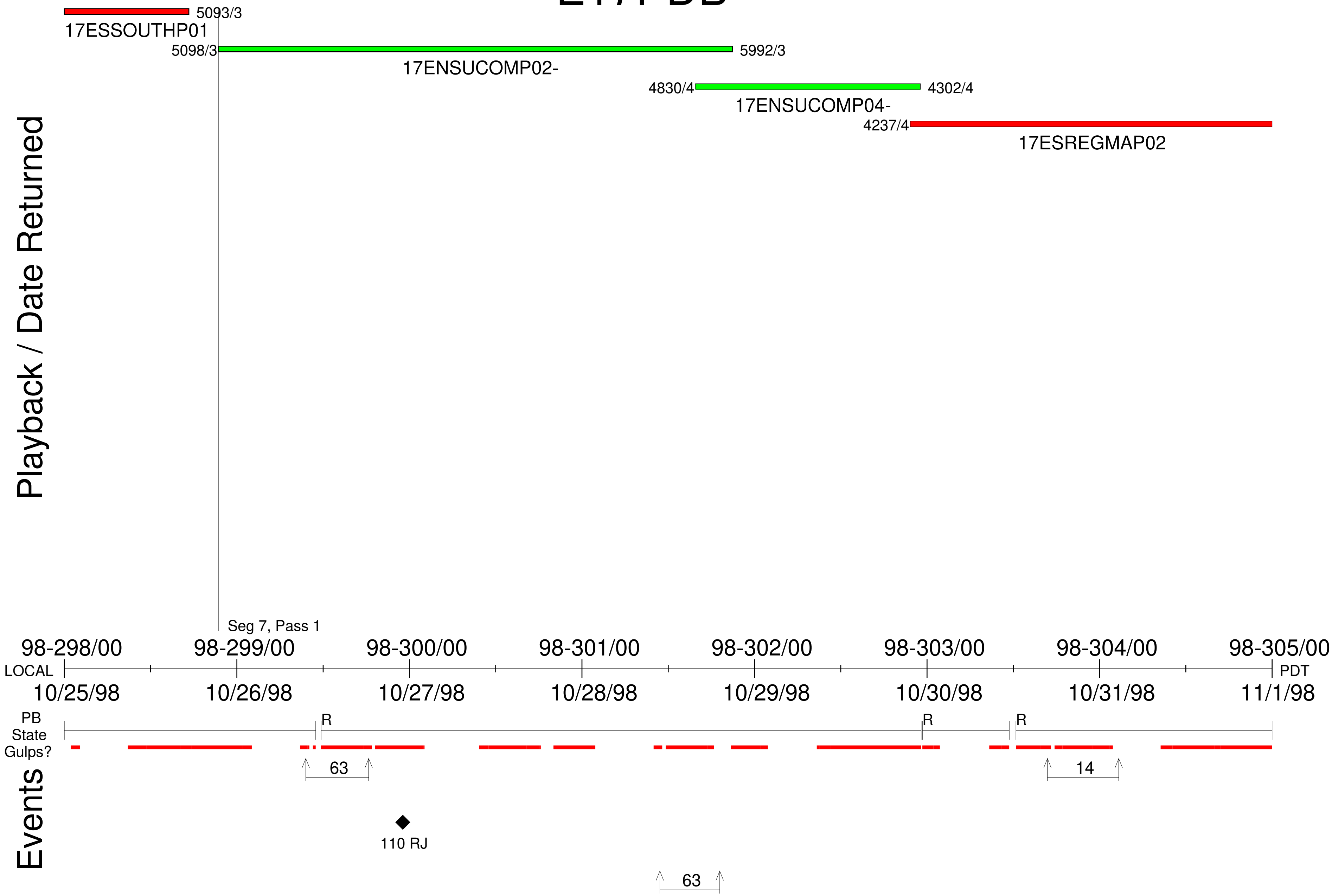
# E17PDB




ORPROs Loaded: orpro.e17afc orpro.e17bfb

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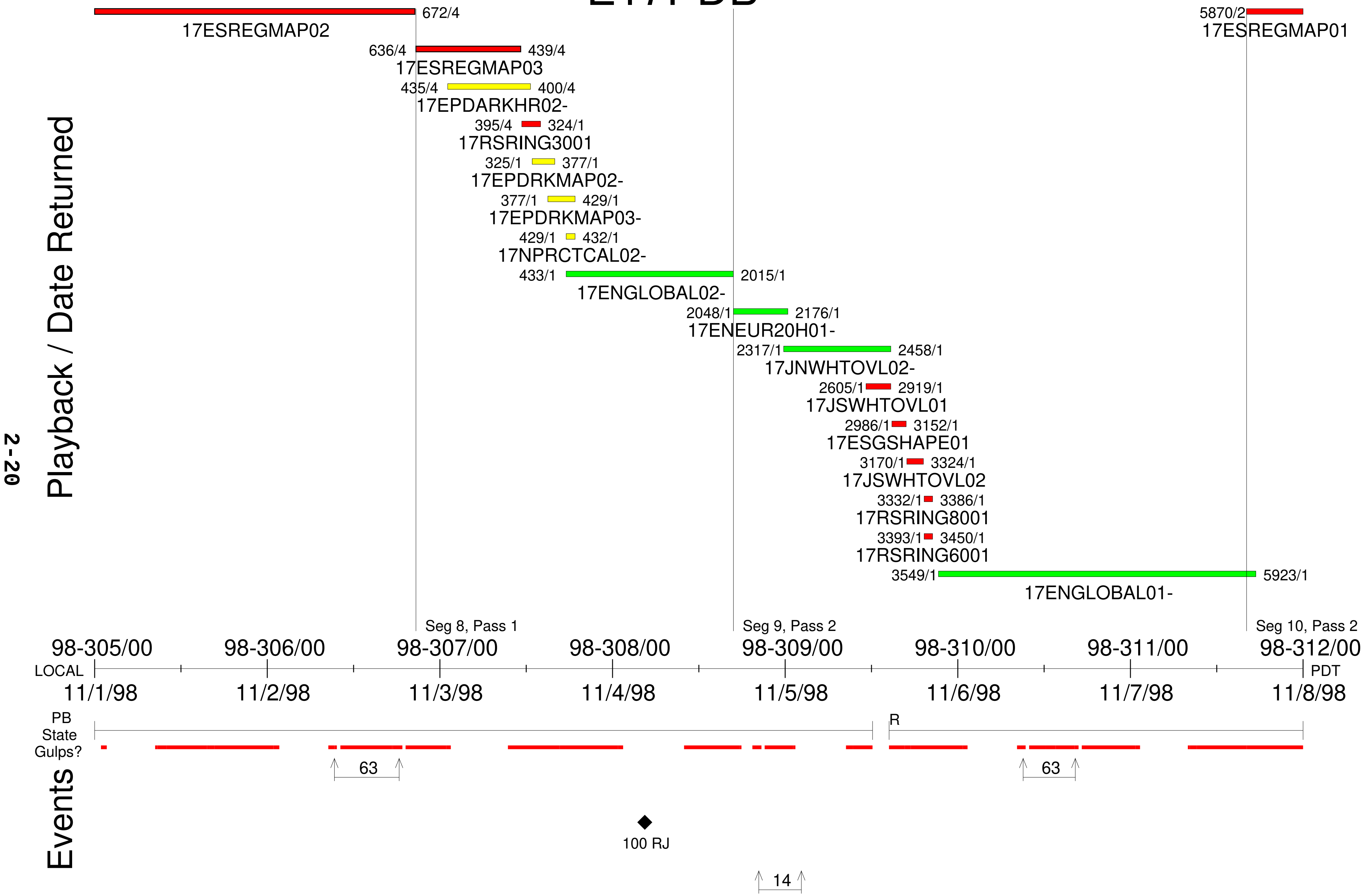
# E17PDB




ORPROs Loaded: orpro.e17afc orpro.e17bfb

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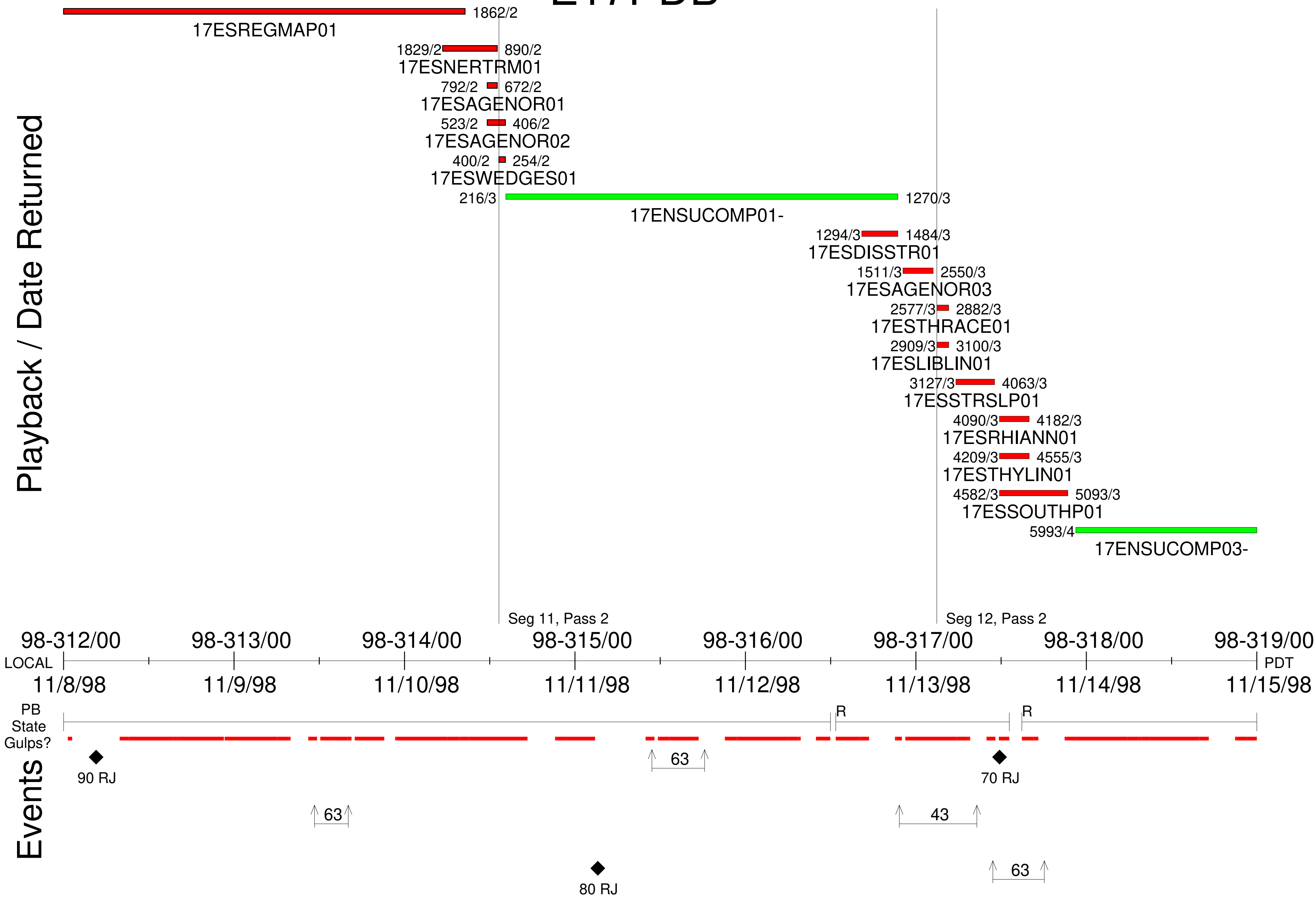
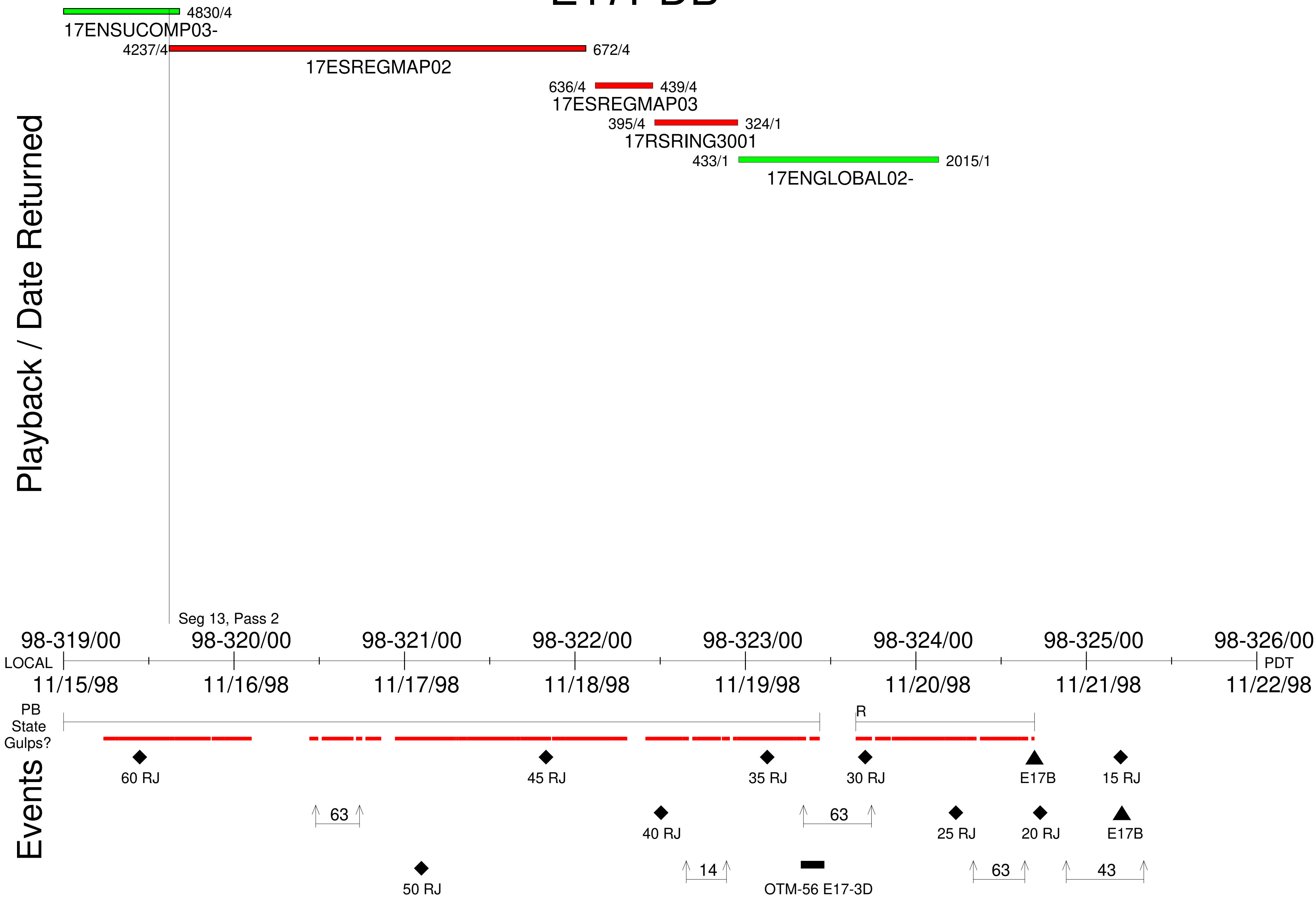
# E17PDB


Playback / Date Returned
1862/2
17ESREGMAP01
1829/2
890/2
17ESNERTRM01
792/2
672/2
17ESAGENOR01
523/2
406/2
17ESAGENOR02
400/2
254/2
17ESWEDGES01
216/3
1270/3
17ENSUCOMP01-
1294/3
1484/3
17ESDISSTR01
1511/3
2550/3
17ESAGENOR03
2577/3
2882/3
17ESTHRACE01
2909/3
3100/3
17ESLIBLIN01
3127/3
4063/3
17ESSTRSLP01
4090/3
4182/3
17ESRHIANN01
4209/3
4555/3
17ESTHYLIN01
4582/3
5093/3
17ESSOUTHP01
5993/4
17ENSUCOMP03-
Seg 11, Pass 2
Seg 12, Pass 2
98-312/00
98-313/00
98-314/00
98-315/00
98-316/00
98-317/00
98-318/00
98-319/00
LOCAL
PDT
11/8/98
11/9/98
11/10/98
11/11/98
11/12/98
11/13/98
11/14/98
11/15/98
PB
State
Gulps?
R
R
Events
90 RJ
63
70 RJ
63
43
80 RJ
63

# E17PDB

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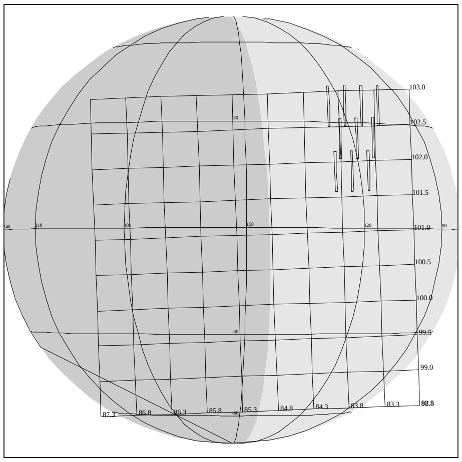
# E17 NIMS A



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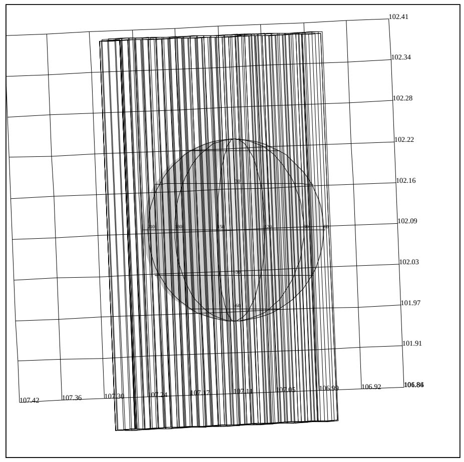

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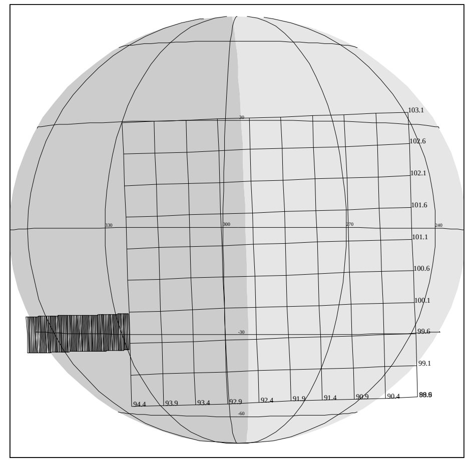

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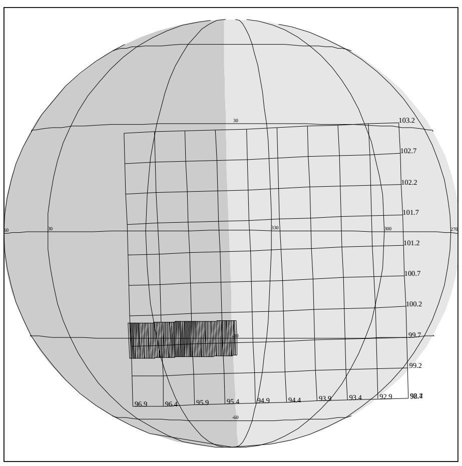

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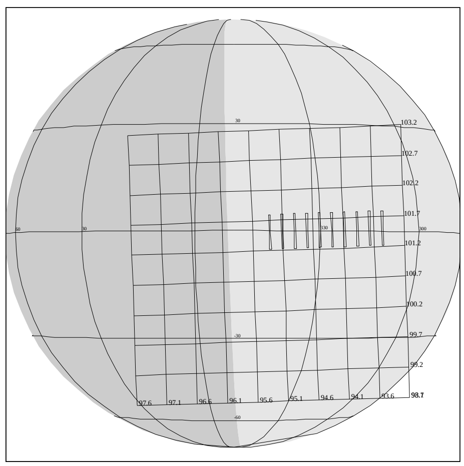

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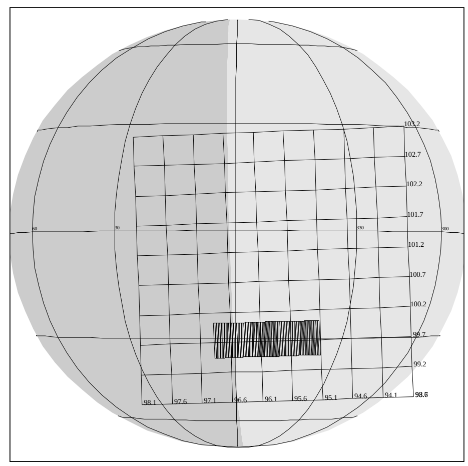

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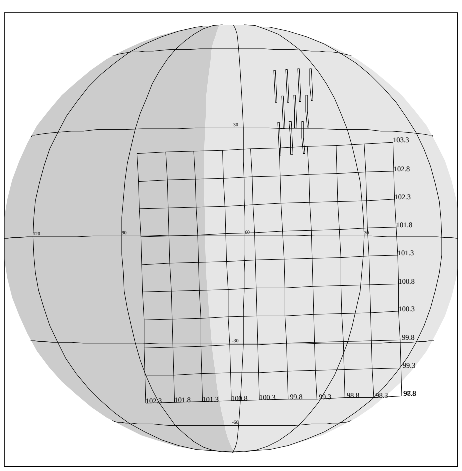

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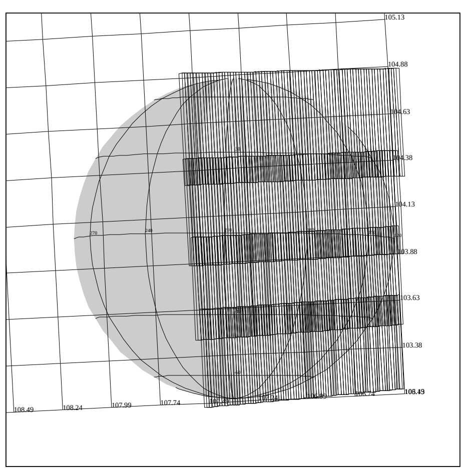

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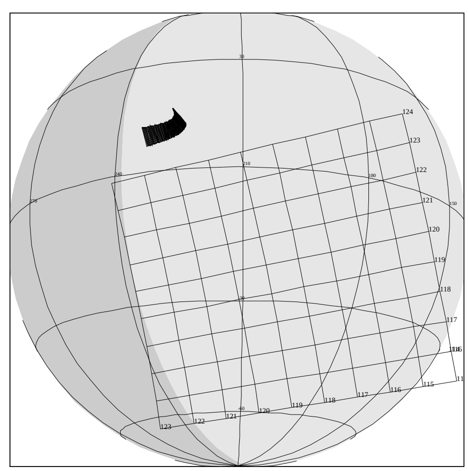

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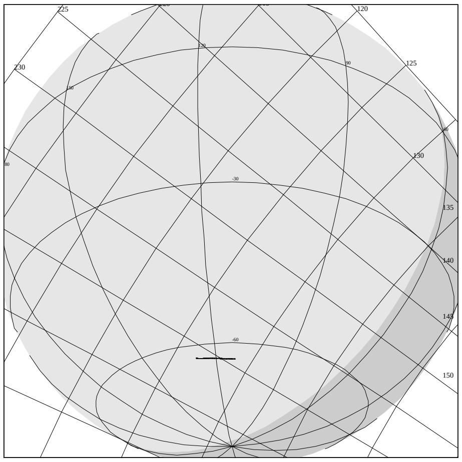

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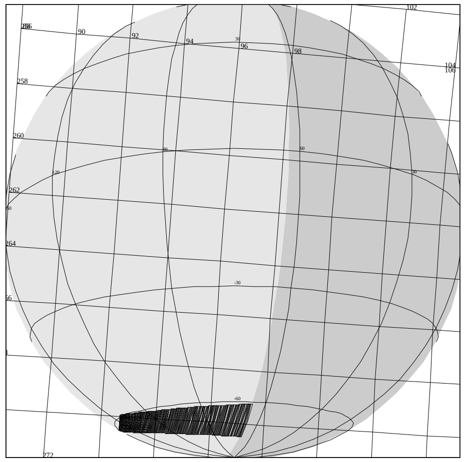

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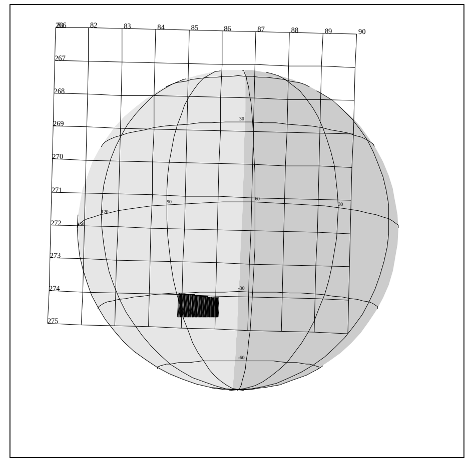

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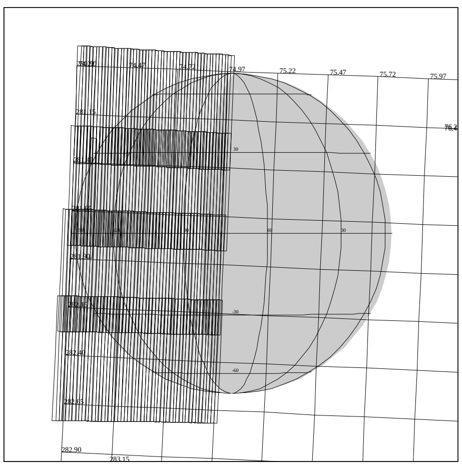

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