PLEROMAN CALENDAR

Technical Specification v0.1

Working Draft — 19 September 2026

An Equinox-Anchored Thirteen-Month Solar Civil Calendar

STATUS OF THIS DOCUMENT
This is a working technical draft, not an adopted national or international standard. It freezes the core calendar architecture sufficiently for independent implementation and testing, while explicitly identifying items that must be finalized before Version 1.0.

Primary design rule

Astronomy determines the year boundary; mathematics determines the calendar structure; human preference does not override either.

Abstract

The Pleroman Calendar is a proposed solar civil calendar organized into thirteen months. The first twelve months contain exactly twenty-eight days each. The thirteenth and final month, Telara, contains the residual days required to complete the interval between successive March-equinox year boundaries. The calendar preserves the ordinary uninterrupted seven-day week and retains familiar civil year numbers such as 2026. This specification defines the astronomical year-boundary rule, month sequence, year numbering, date arithmetic, conversion algorithms, weekday behavior, machine representation, and conformance requirements for a reference implementation.

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1. Scope and status

This document specifies the core rules required to identify, calculate, convert, display, and test Pleroman Calendar dates. It is written so that an independent implementer can reproduce the calendar without relying on the original website or informal descriptions.

Version 0.1 is intentionally conservative. It standardizes only rules that are presently necessary for deterministic calendar behavior. Questions of public holidays, accounting practice, religious observance, user-interface design, governance, and political adoption are outside the normative core unless they affect date correctness.

2. Conformance language

The uppercase key words MUST, MUST NOT, SHOULD, SHOULD NOT, and MAY are used in their requirements-language sense consistent with BCP 14 / RFC 2119 and RFC 8174. Lowercase uses of these words are ordinary prose.

3. Design objectives and non-objectives

3.1 Objectives

- Anchor each civil year to the March equinox using an Earth-rotation-based reference day.
- Use thirteen named months while preserving a continuous seven-day week.
- Make Months 1–12 exactly 28 days each.
- Confine annual residual-day variation to the terminal month, Telara.
- Restore September, October, November, and December to month numbers 7, 8, 9, and 10.
- Retain familiar civil year labels so that the Pleroman year beginning at the March equinox of 2026 is Year 2026.
- Provide deterministic, reversible conversion to and from a proleptic Gregorian reference date.
- Avoid assigning astronomical events to preferred dates; calculated events land wherever the astronomy places them.

3.2 Non-objectives

- The Pleroman Calendar is not a lunar calendar; lunar phases do not control month boundaries.
- The calendar does not require every year to begin on the same weekday.
- The calendar does not insert “blank” days outside the week or outside a month.
- The calendar does not define the historical date of the birth of Jesus or any other disputed historical event.
- The calendar does not attempt to replace astronomical standards, time scales, ephemerides, or Earth-orientation models.

4. Normative terminology

Term	Definition
March equinox	The annual northward equinox associated with the Sun crossing the celestial equator near March. It is a single astronomical instant.
TT (Terrestrial Time)	A uniform astronomical time scale used as an argument in modern ephemeris and Earth-orientation models.

Term	Definition
UT1	Universal Time based on the Earth Rotation Angle; the modern form of mean solar time at the Greenwich meridian.
Canonical equinox date	The proleptic Gregorian calendar date at Greenwich whose UT1 interval from 00:00:00 through immediately before the next 00:00:00 contains the March equinox instant.
Pleroman year Y	The Pleroman year whose canonical March-equinox date occurs in proleptic Gregorian year Y.
Ordinary Pleroman year	A Pleroman year containing 365 days.
Extended Pleroman year	A Pleroman year containing 366 days.
Telara	Month 13, the final month of the Pleroman year.
Residual days	The days remaining after the fixed 336 days assigned to Months 1–12. They are assigned to Telara.
Proleptic Gregorian calendar	The Gregorian calendar rules extended backward or forward without inserting or deleting historical transition dates.

5. Calendar structure

5.1 Month sequence

No.	Month	Length	Zero-based start offset
1	March	28	0
2	April	28	28
3	May	28	56
4	June	28	84
5	July	28	112
6	August	28	140
7	September	28	168
8	October	28	196
9	November	28	224

No.	Month	Length	Zero-based start offset
10	December	28	252
11	January	28	280
12	February	28	308
13	Telara	variable	336

Months 1–12 MUST contain exactly 28 days. Telara MUST begin at day offset 336 from March 1 and MUST contain all remaining calendar days before the next Pleroman March 1.

5.2 Year numbering

The Pleroman year number MUST equal the proleptic Gregorian year containing that year's canonical March-equinox date. Therefore Pleroman Year 2026 begins on the canonical March-equinox date in Gregorian year 2026 and continues until the day immediately preceding the canonical March-equinox date in Gregorian year 2027.

Consequently, local civil dates in January, February, and part of March may belong to the preceding Pleroman year. This is a direct consequence of March-based year numbering and is not an error condition.

5.3 New Year

March 1 is New Year's Day. The canonical reference date for March 1 is established by Section 6. The phrase "March 1 is the equinox" means that the year is assigned to the civil date containing the astronomical equinox under the reference rule; it does not mean that the civil day begins at the exact equinox instant.

6. Astronomical year boundary

6.1 Governing event

The sole astronomical event governing the Pleroman year boundary is the March equinox. Solstices, the September equinox, perihelion, aphelion, lunar phases, religious dates, and civil holidays MUST NOT alter the year boundary.

6.2 Reference time scales

A conforming astronomical implementation SHOULD determine the March equinox using a recognized modern solar ephemeris or algorithm expressed in an appropriate uniform astronomical time scale such as TT or TDB. The resulting event instant MUST be converted to UT1 for assignment to the canonical Greenwich date. IERS Earth-orientation data or an accepted ΔT model appropriate to the date range MUST be used for the TT-to-UT1 relationship.

Rationale (informative): UT1 is tied to the Earth Rotation Angle and is the modern realization of mean solar time at Greenwich. It therefore provides a more physically appropriate reference for assigning an Earth/Sun seasonal event to a Greenwich day than an administratively maintained atomic civil time scale.

6.3 Canonical March 1 rule

Let E(Y) be the March-equinox instant associated with proleptic Gregorian year Y, expressed in UT1 at the Greenwich meridian. Let A(Y) be the proleptic Gregorian date whose UT1 day interval [00:00:00, 24:00:00) contains E(Y). Then A(Y) is the canonical reference date of Pleroman March 1 in Year Y.

```
A(Y) = GregorianDate_UT1( E(Y) )
```

If an equinox occurs exactly at 00:00:00 UT1, it belongs to the new UT1 date beginning at that instant. No rounding-to-nearest-day rule is used.

6.4 Reference meridian and global consistency

The Greenwich meridian is the sole meridian used to assign the canonical equinox date. Implementations MUST NOT assign different Pleroman New Year dates based on the user's longitude or time zone. This prevents the structural calendar from differing by jurisdiction.

7. Year length and Telara

The length L(Y) of Pleroman Year Y is the integer number of civil dates from A(Y), inclusive, to A(Y+1), exclusive:

```
L(Y) = A(Y+1) − A(Y)   [integer civil-day difference]
```

The fixed contribution of Months 1–12 is 336 days. Therefore the length T(Y) of Telara is:

```
T(Y) = L(Y) − 336
```

Within the presently intended civil-use range, T(Y) is expected to be 29 or 30 days. A conforming implementation MUST calculate T(Y) from the astronomical boundary dates and MUST NOT infer it from the Gregorian leap-year rule. It MUST NOT silently force Telara to 29 or 30 if the boundary calculation produces another value; such a result must be surfaced as a conformance or validity-range condition pending review.

Terminology note: Telara 29 is the ordinary 365th day in a 365-day year. Telara 30 is the additional day in a 366-day year. Therefore "all irregularity is concentrated in Telara" is accurate, while only the additional 366th day is strictly intercalary.

8. Weekday continuity

The Pleroman Calendar MUST preserve an uninterrupted seven-day weekday sequence. No calendar date may exist outside the week. Telara 29 and Telara 30 are ordinary weekdays.

Because 28 is divisible by 7, the first day of every Pleroman month in a given year falls on the same weekday, and days 1–28 share the same weekday pattern in every month of that year. The weekday pattern is not required to repeat in the following year.

For conversion purposes, the weekday of a Pleroman date MUST equal the weekday of the corresponding local civil day in the underlying continuous day sequence. An implementation that changes the weekday when only the calendar label changes is non-conforming.

9. Date conversion algorithms

9.1 Gregorian reference date → Pleroman date

Input G is a proleptic Gregorian civil date. Find the unique year Y satisfying:

```
A(Y) ≤ G < A(Y+1)
```

Define the zero-based day offset d:

```
d = G − A(Y)
```

If d < 336:

```
month_number = floor(d / 28) + 1
day = (d mod 28) + 1
```

If d ≥ 336:

```
month_number = 13  [Telara]
day = d − 335
```

9.2 Pleroman date → Gregorian reference date

For Months 1–12:

```
offset = 28 × (month_number − 1) + (day − 1)
```

For Telara:

```
offset = 336 + (day − 1)
```

Then:

```
G = A(Y) + offset
```

The input Pleroman date is valid only if its day is within the month length computed for Year Y.

9.3 Round-trip requirement

For every valid date inside an implementation's declared conformance interval, both of the following identities MUST hold:

```
Gregorian → Pleroman → Gregorian = original Gregorian date
Pleroman → Gregorian → Pleroman = original Pleroman date
```

10. Local civil-day behavior and time zones

The astronomical year boundary is globally defined by the Greenwich UT1 rule, but ordinary Pleroman dates are civil-date labels and SHOULD roll over at local midnight according to the applicable local time-zone rules, just as ordinary civil dates do.

Accordingly, the same physical instant may have different Pleroman dates in different time zones near local midnight. This is normal civil-calendar behavior and does not create multiple versions of the calendar.

Software implementations SHOULD use an established time-zone rules database (for example, the IANA Time Zone Database) when converting timestamps to local Pleroman dates. The calendar specification itself does not define political time-zone boundaries or daylight-saving rules.

Important distinction: a local observer's March equinox may occur on a different local Gregorian date from the canonical Greenwich date. That local difference does not move Pleroman March 1. The reference meridian determines the structural date; the local time zone determines when that date begins locally.

11. Text and machine representation

ISO 8601 currently specifies Gregorian calendar representations and excludes non-Gregorian date elements. Therefore Pleroman dates MUST NOT be emitted as bare strings that could reasonably be mistaken for valid ISO 8601 Gregorian dates.

Until a formal interchange standard exists, this draft RECOMMENDS an explicit namespace prefix:

```
PC:2026-07-16     # Pleroman 2026, September 16
PC:2026-13-29     # Pleroman 2026, Telara 29
```

Month numbers MUST be 01–13 in fixed-width machine representation. Human-facing displays SHOULD use month names by default.

12. Astronomical annotations

The June solstice, September equinox, December solstice, perihelion, aphelion, and lunar phases MAY be displayed as informational annotations. They MUST be calculated independently and MUST NOT be assigned to preferred Pleroman dates.

The March equinox is unique among these events because it determines the year boundary. All other events are observational metadata within the resulting calendar year.

13. Conformance requirements

ID	Requirement
C-01	Months 1–12 are exactly 28 days.
C-02	Month 13 is Telara and begins at zero-based year offset 336.
C-03	The year boundary is determined from the March equinox using the canonical Greenwich UT1 date rule.
C-04	Year labels equal the proleptic Gregorian year containing the canonical March-equinox date.
C-05	Telara length is computed from A(Y+1) − A(Y) − 336, not from Gregorian leap-year status.
C-06	No blank or weekless day exists.
C-07	Weekday continuity is preserved across every month and year boundary.
C-08	Gregorian-to-Pleroman conversion is deterministic.
C-09	Pleroman-to-Gregorian conversion is deterministic.
C-10	Both conversion directions pass round-trip identity tests.
C-11	Astronomical annotations other than the March equinox do not alter calendar structure.
C-12	Machine-readable output identifies the calendar explicitly and is not falsely represented as ISO 8601 Gregorian data.

14. Initial test vectors

The following examples are initial conformance vectors for modern dates. The March-equinox dates for 2025–2027 are consistent with U.S. Naval Observatory season data at Universal Time; the day-level UT1 assignment is the same for these examples because the event times are far from the civil-day boundary.

Gregorian reference date	Expected Pleroman date	Note
2025-03-20	PC:2025-01-01	Pleroman New Year 2025
2026-03-19	PC:2025-13-29	Final day of Pleroman 2025
2026-03-20	PC:2026-01-01	Pleroman New Year 2026

Gregorian reference date	Expected Pleroman date	Note
2026-04-16	PC:2026-01-28	Final day of March
2026-04-17	PC:2026-02-01	April 1
2026-09-19	PC:2026-07-16	September 16
2026-12-25	PC:2026-11-01	January 1
2027-03-19	PC:2026-13-29	Final day of Pleroman 2026
2027-03-20	PC:2027-01-01	Pleroman New Year 2027

A later validation annex SHOULD add: every year boundary from at least 1900–2100 using an authoritative source, computational validation through the intended long-range support horizon, exact weekday test vectors, edge cases near 00:00 UT1, and independent implementation results.

15. Open items before v1.0

Canonical reference ephemeris / algorithm: Version 1.0 should designate either a specific authoritative data product or a precisely reproducible astronomical algorithm/model for the March equinox so independent implementations cannot diverge on a near-midnight event.

UT1 realization outside observed/published ranges: Near-term UT1 is observational. Long-range future UT1 requires prediction or a ΔT model. Version 1.0 should define the accepted prediction source and the rule for later revisions when improved Earth-rotation data become available.

Validity interval: The project should publish a declared validated interval (for example, 1900–2100 authoritative and an extended computational interval through 3000) and distinguish validated dates from extrapolated dates.

Historical / BCE profile: A future profile should define signed/expanded year representation and exact display rules for astronomical year 0 versus BC/AD or BCE/CE notation.

Governance: A published standard should identify who may issue errata, approve specification revisions, and declare authoritative year-boundary tables.

Independent reproduction: At least one implementation created from the written specification alone should reproduce the reference implementation and test vectors before v1.0 is declared.

Appendix A. Mathematical properties (informative)

Fixed core length: 12 × 28 = 336 days.

Full 28-day month grid: 13 × 28 = 364 days. Thus the first 28 days of Telara complete exactly 52 seven-day weeks.

Ordinary year: 364 + Telara 29 = 365 days.

Extended year: 364 + Telara 29 + Telara 30 = 366 days.

Monthly weekday regularity: 28 mod 7 = 0; therefore every month begins on the same weekday within a given Pleroman year.

Year-to-year weekday advance: A 365-day year advances the next March 1 by one weekday; a 366-day year advances it by two.

December 25 position: December is Month 10 and begins at offset 252; December 25 is offset 276 from March 1.

January 1 position: January is Month 11 and begins at offset 280 from March 1.

Appendix B. Reference sources

[1] U.S. Naval Observatory, Astronomical Applications Department. “Earth’s Seasons — Equinoxes, Solstices, Perihelion, and Aphelion.” Provides season-event dates/times for 1700–2100 and notes that equinoxes/solstices mark seasonal boundaries. https://aa.usno.navy.mil/data/Earth_Seasons

[2] U.S. Naval Observatory. “Sidereal Time.” Notes that UT1 is a form of Universal Time affected by irregularities in Earth’s rotation and is the modern version of mean solar time on the Greenwich meridian. https://aa.usno.navy.mil/data/siderealtime

[3] International Earth Rotation and Reference Systems Service (IERS). Time and Earth-rotation FAQs. Describes TT as the time argument used with IAU precession/nutation models and UT1 as Earth-rotation time. https://www.iers.org/IERS/EN/Service/FAQs/Time/time_node.html

[4] NASA Goddard Space Flight Center, Fred Espenak. “Delta T (ΔT).” Explains the difference between uniform dynamical/terrestrial time and Universal Time for astronomical event conversion. https://eclipse.gsfc.nasa.gov/SEcat5/deltat.html

[5] ISO 8601-1:2019. “Date and time — Representations for information interchange — Part 1: Basic rules.” Current standard specifies Gregorian calendar date representations and excludes non-Gregorian calendar date elements. https://committee.iso.org/standard/70907.html

[6] ISO/TC 154 working draft material on proleptic Gregorian use. Notes that Gregorian rules may be extended before historical adoption by agreement and that no historical transition dates are inserted or deleted in that proleptic representation. https://www.loc.gov/standards/datetime/iso-tc154-wg5_n0038_iso_wd_8601-1_2016-02-16.pdf

[7] RFC Editor, BCP 14 / RFC 2119 and RFC 8174. Defines the uppercase requirements terms MUST, SHOULD, MAY, and related forms used in technical specifications. https://www.rfc-editor.org/info/rfc2119/ ; https://www.rfc-editor.org/info/rfc8174/

End of Pleroman Calendar Specification v0.1 — Working Draft