The Framework Frequency

$f_0 = 2^{12} \times 3^6 \times 5^5 = 9{,}331{,}200{,}000$ Hz

12:00:00:00:00:00 in Base-60

Part 1 — Identity

The Number

The framework frequency is:

$f_0 = 9{,}331{,}200{,}000$ Hz = 9.3312 GHz

Its prime factorisation uses only the sacred triangle primes:

$f_0 = 2^{12} \times 3^6 \times 5^5 = 4{,}096 \times 729 \times 3{,}125$

No other prime divides it. It is the largest {2,3,5}-smooth number whose structure encodes the framework's geometric constants through its exponents, its factorisations, and its subharmonics.

The Exponents

The exponents (12, 6, 5) are not arbitrary:

Property	Value	Framework Identity
Sum	12 + 6 + 5 = 23	—
Product	12 × 6 × 5 = 360	The year circle, degrees in a circle
Individual	12	Dodecahedron faces
Individual	6	Cube faces, hexagon vertices
Individual	5	Pentagon sides, F(5)

The exponents multiply to the year. Each exponent names a face count of a Platonic or regular polygon. The frequency encodes geometry in its very prime structure.

High Noon

In the Sumerian sexagesimal (base-60) system:

$f_0 = 12 \times 60^5 = 12{:}00{:}00{:}00{:}00{:}00_{60}$

High noon. The dodecahedron followed by five zeros. The simplest non-trivial large number in the system that gave humanity hours, minutes, and angular degrees.

This is not a frequency constructed to look clean in base-60. The construction was $2^{12} \times 3^6 \times 5^5$, obtained from the sacred triangle primes. The fact that this equals 12×60^5 is a consequence of the arithmetic: $60 = 2^2 \times 3 \times 5$ absorbs five copies of each prime, leaving $12 = 2^2 \times 3$ as the residual. The base-60 cleanliness is intrinsic to the prime structure, not imposed on it.

Equivalently:

Expression	Meaning
12×60^5	Dodecahedron faces × (Base-60)^pentagon
720×60^4	$6! \times$ (Base-60)^4
45×120^4	(Lambda/2) × (120-cell)^4
25,920 × 360,000	Great Year × (year-circle × 1,000)

Every factorisation tells a framework story.

Physical Properties

Property	Value
Frequency	9.3312 GHz
Wavelength	3.213 cm (X-band microwave)
Energy	38.59 μeV
Temperature	0.448 K
Period	107.17 picoseconds

For comparison: Cs-133 hyperfine = 9.193 GHz (1.5% below f_0). The definition of our second sits ten minutes to twelve on the cosmic clock.

Part 2 — The Subharmonic Ladder

The Principle

Because $f_0 = 2^{12} \times 3^6 \times 5^5$, it has exactly $13 \times 7 \times 6 =$ **546** divisors, all {2,3,5}-smooth. Every division of f_0 by any such divisor produces another {2,3,5}-smooth frequency. The ladder never breaks. From 9.3 GHz microwave down to sub-ELF wavelengths larger than the Earth, every rung is clean.

The Complete Ladder

SHF — Microwave (f_0 itself)

Divisor	Framework Identity	Frequency	Wavelength
1	Unity	9.3312 GHz	3.21 cm
2	Loom seed	4.6656 GHz	6.43 cm
3	Loom	3.1104 GHz	9.64 cm
4	Hopf / L(3)	2.3328 GHz	12.85 cm
5	Pentagon / F(5)	1.8662 GHz	16.06 cm
6	Cube faces	1.5552 GHz	19.28 cm
8	Octahedron / F(6)	1.1664 GHz	25.70 cm

The framework frequency and its first few subharmonics span the microwave band used by radar, satellite communication, and atomic clocks.

UHF — Television and Mobile

Divisor	Framework Identity	Frequency	Wavelength
10	Decade	933.12 MHz	32.13 cm
12	Dodecahedron	777.60 MHz	38.55 cm
18	Lambda (Λ)	518.40 MHz	57.83 cm
20	Icosahedron faces	466.56 MHz	64.26 cm
24	24-cell	388.80 MHz	77.11 cm
30	Base-60 / 2	311.04 MHz	96.38 cm

VHF — FM Radio

Divisor	Framework Identity	Frequency	Wavelength
45	Lambda/2	207.36 MHz	1.4 m
60	Base-60	155.52 MHz	1.9 m
100	10^2	93.31 MHz	3.2 m
108	**Sacred**	**86.40 MHz**	**3.5 m**
120	120-cell	77.76 MHz	3.9 m
144	F(12)	64.80 MHz	4.6 m
216	**Plato's Number**	**43.20 MHz**	**6.9 m**

The sacred number 108 produces 86.4 MHz — and 86,400 is the number of seconds in a day. Plato's Number 216 produces 43.2 MHz — and 432 is twice 216, the ancient tuning frequency.

HF — Shortwave

Divisor	Framework Identity	Frequency	Wavelength
360	**Year circle**	**25.92 MHz**	**11.6 m**
432	**2 × 216**	**21.60 MHz**	**13.9 m**
600	600-cell	15.55 MHz	19.3 m
720	**6!**	**12.96 MHz**	**23.1 m**
1,000	10^3	9.331 MHz	32.1 m
1,080	10 × sacred	8.640 MHz	34.7 m
1,728	12^3	5.400 MHz	55.5 m
2,160	**10 × 216**	**4.320 MHz**	**69.4 m**

The year circle (360) gives 25.92 MHz — the precession cycle (25,920 years) echoed in megahertz. The Kali Yuga unit (432,000) connects to 21.6 MHz. Every framework constant that appears in the cyclical ages reappears here as a shortwave frequency.

MF — Medium Wave (AM Radio)

Divisor	Framework Identity	Frequency	Wavelength
3,600	60^2 = seconds/hour	2.592 MHz	115.7 m
4,320	Kali ÷ 100	2.160 MHz	138.8 m
7,776	6^5	1.200 MHz	249.8 m
8,640	**Seconds/day ÷ 10**	**1.080 MHz**	**277.6 m**
10,000	10^4	933.12 kHz	321.3 m
10,800	100 × sacred	864.00 kHz	347.0 m
20,736	12^4	450.00 kHz	666.2 m
21,600	60 × year	432.00 kHz	694.0 m
25,920	**Great Year**	**360.00 kHz**	**832.8 m**

The Great Year (precession cycle of 25,920 years) gives exactly 360 kHz — the year circle in kilohertz. The conjugate pairs begin to emerge here.

LF — Longwave

Divisor	Framework Identity	Frequency	Wavelength
43,200	Seconds in 12 hours	216.00 kHz	1.4 km
86,400	**Seconds per day**	**108.00 kHz**	**2.8 km**
108,000	1,000 × sacred	86.40 kHz	3.5 km
129,600	Year²	72.00 kHz	4.2 km
216,000	1,000 × 216	43.20 kHz	6.9 km
259,200	10 × Great Year	36.00 kHz	8.3 km

The seconds in a day (86,400) give 108 kHz — the sacred number in kilohertz. The reciprocal symmetry is now fully visible.

VLF — Submarine Communication

Divisor	Framework Identity	Frequency	Wavelength
360,000	1,000 × year	25.92 kHz	11.6 km
432,000	1,000 × 432	21.60 kHz	13.9 km
777,600	$60^5/60$	12.00 kHz	25.0 km
864,000	10 × seconds/day	10.80 kHz	27.8 km
933,120	$f_0 / 10^4$	10.00 kHz	30.0 km

ULF to ELF — Geomagnetic and Schumann Regime

Divisor	Framework Identity	Frequency	Wavelength
9,331,200	$f_0 / 10^3$	1.000 kHz	300 km
12,960,000	60^4	720 Hz	416 km
25,920,000	f_0 / year	360 Hz	833 km
43,200,000	$f_0 / 216$	216 Hz	1,388 km
77,760,000	$f_0 / 120$	120 Hz	2,498 km
86,400,000	$f_0 / 108$	108 Hz	2,776 km
155,520,000	$f_0 / 60$	60 Hz	4,997 km
311,040,000	$f_0 / 30$	30 Hz	9,993 km
466,560,000	$f_0 / 20$	20 Hz	14,990 km
777,600,000	f_0 / dodec = 60^5	12 Hz	24,983 km
933,120,000	$f_0 / 10$	10 Hz	29,979 km
1,866,240,000	f_0 / F(5)	5 Hz	59,959 km
2,332,800,000	f_0 / L(3)	4 Hz	74,948 km
3,110,400,000	f_0 / Loom	3 Hz	99,931 km
4,665,600,000	$f_0 / 2$	2 Hz	149,896 km

At the bottom of the ladder, $f_0 \div 60^5 = 12$ Hz — a wavelength of nearly 25,000 km, comparable to Earth's circumference. $f_0 \div 10 = 10$ Hz sits in the Schumann resonance regime. The framework frequency, divided

down through its own internal structure, reaches the planetary scale.

Part 3 — The Reciprocal Symmetry

Conjugate Pairs

The most remarkable property of the subharmonic ladder is its internal mirror. Framework constants pair with each other inside f_0, each pair multiplying to the same value:

Constant A	Constant B	A × B	$f_0 \div A$	$f_0 \div B$
108 (sacred)	86,400 (seconds/day)	9,331,200	86.4 MHz	108 kHz
216 (Plato's Number)	43,200 (half-day seconds)	9,331,200	43.2 MHz	216 kHz
360 (year circle)	25,920 (Great Year)	9,331,200	25.92 MHz	360 kHz
432 (2 × 216)	21,600 (60 × year)	9,331,200	21.6 MHz	432 kHz
720 (6!)	12,960 (year × 36)	9,331,200	12.96 MHz	720 kHz

Every pair multiplies to 9,331,200 = f_0 / 1,000.

The sacred number and the seconds in a day are conjugate. The year circle and the precession cycle are conjugate. Plato's Number and half-day seconds are conjugate. Each constant, divided into f_0, yields its partner (times 1,000) as a frequency. The framework constants are not independent quantities scattered through history — they are paired reflections inside a single number.

This is why 108 appears in meditation traditions (sacred) and 86,400 appears in timekeeping (seconds per day). They are the same relationship viewed from opposite ends. This is why 360 appears in geometry (degrees) and 25,920 appears in astronomy (precession). They are conjugate harmonics of f_0.

The Mirror Formula

For any conjugate pair (A, B) where A × B = $f_0/1000$:

$f_0 \div A = B \times 1{,}000$ $f_0 \div B = A \times 1{,}000$

Dividing f_0 by one constant of the pair gives the other constant, shifted by three decimal places (= 10^3 = the cube of the decade). The factor of 1,000 is itself {2,3,5}-smooth (= $2^3 \times 5^3$), so it preserves the cleanliness.

Part 4 — The Base-60 Clock

Clock Arithmetic

The subharmonic ladder is literally a clock. In base-60:

Frequency	Base-60	Clock Reading
f_0	12:00:00:00:00:00	Twelve o'clock (6 digits)
$f_0 / 2$	06:00:00:00:00:00	Six o'clock
$f_0 / 3$	04:00:00:00:00:00	Four o'clock
$f_0 / 4$	03:00:00:00:00:00	Three o'clock
$f_0 / 6$	02:00:00:00:00:00	Two o'clock
$f_0 / 10$	01:12:00:00:00:00	One-twelve
$f_0 / 12$	01:00:00:00:00:00	One o'clock
$f_0 / 60$	12:00:00:00:00	Twelve o'clock (5 digits)
$f_0 / 120$	06:00:00:00:00	Six o'clock (5 digits)
$f_0 / 360$	02:00:00:00:00	Two o'clock (5 digits)
$f_0 / 720$	01:00:00:00:00	One o'clock (5 digits)
$f_0 / 25{,}920$	01:40:00:00	One-forty (4 digits)
$f_0 / 86{,}400$	30:00:00	Thirty (3 digits)

Each division by 60 drops one sexagesimal digit — the clock face scales down one level. Each division by 12 moves the "hour hand" from twelve to one. The electromagnetic spectrum, from microwave to ELF, is the same twelve-hour clock face read at different scales.

This is not a metaphor. It is arithmetic. $f_0 = 12 \times 60^5$, so $f_0/60 = 12 \times 60^4$, $f_0/60^2 = 12 \times 60^3$, and so on. The self-similarity is exact: the clock looks the same at every scale, with one fewer digit each time. This is the sexagesimal equivalent of a fractal — the same pattern at every level of magnification.

Part 5 — The 120^4 Skeleton

Shared Structure with Hydrogen

The framework frequency and the hydrogen 21cm line share a geometric core:

Frequency	Expression	Coefficient	Nature
f_0	45×120^4	$45 = 3^2 \times 5$	Integer (Loom)
$H_{21}cm$	$\varphi^4 \times 120^4$	$\varphi^4 = 3\varphi + 2 \approx 6.854$	Irrational (Weaving)

Both are the 120-cell polytope raised to the fourth power — the 4D regular solid raised to its own dimension — multiplied by a coefficient. The difference is the coefficient.

f_0 uses **$45 = \text{Lambda}/2 = 3^2 \times F(5)$**, a rational integer built entirely from sacred triangle primes. It is the half-Lambda, the sum of the first nine natural numbers, a triangular number. Pure Loom.

H_{21}cm uses **$\varphi^4 = 3\varphi + 2 = (7 + 3\sqrt{5})/2$**, an irrational number involving the golden ratio. Pure Weaving.

The 120-cell raised to the fourth power is the shared skeleton. f_0 dresses it in integers. Hydrogen dresses it in φ. The ratio between them is:

$f_0 / H_{21}\text{cm} \approx 45/\varphi^4 = (315 - 135\sqrt{5})/2 \approx 6.565$

This is the Loom-to-Weaving transformation expressed as a frequency ratio. The pure geometric structure (f_0), when filtered through the golden ratio (φ^4), produces the hydrogen line. The integer becomes irrational. The rational becomes living.

The Full Chain

The three fundamental frequencies — f_0, Cs-133, and H_{21}cm — form a chain connected by framework constants:

Relationship	Expression	Precision
Cs / H_{21}cm	$4\varphi = L(3) \times \varphi$	47 ppm
f_0 / H_{21}cm	$45/\varphi^4$	607 ppm
Cs / f_0	$4\varphi^5/45 = (20\varphi + 12)/45$	653 ppm

The hydrogen line (F(1) atom, Z = 1) and caesium (F(10) atom, Z = 55) are linked by 4φ. The framework frequency and hydrogen share the 120^4 skeleton with different dressings. Caesium sits between them — 1.5% below f_0, the metrologists' best available approximation to the cosmic clock, chosen without framework awareness.

Since $\varphi^5 = 5\varphi + 3 = F(5)\varphi + L(2)$, the full chain can be written:

$\text{Cs} \approx f_0 \times 4(5\varphi + 3)/45 = f_0 \times (20\varphi + 12)/45$

The time standard equals the framework frequency times a ratio of Fibonacci and Lucas numbers weighted by the golden ratio, over half the Pythagorean Lambda.

Part 6 — The Root Decomposition of H_{21}cm

Measurement Due Diligence

The hydrogen 21cm line is a spin-flip transition: the electron in ground-state hydrogen flips its spin orientation relative to the proton, from parallel (F=1) to anti-parallel (F=0). The laboratory value is:

ν_0 = 1,420,405,751.768(2) Hz

Known to approximately 1 part in 10^{12}, measured by hydrogen maser experiments cross-referenced to the Cs-133 standard. The ratio $H_{21}cm/Cs = 0.15451568...$ is the unit-independent measurement — a pure number determined entirely by atomic physics.

The theoretical formula (Fermi contact interaction) depends on α (fine structure constant), g_p (proton g-factor from QCD), the electron-to-proton mass ratio, the Rydberg constant, and QED corrections. The Fermi prefactor 8/3 = F(6)/L(2) is itself a framework ratio.

Three Roots, Three Stories

The hydrogen frequency decomposes cleanly through its roots:

Fourth root (152 ppm):

$\sqrt[4]{H_{21}cm}$	120φ
194.1347	194.1641

$H_{21}cm = (120\varphi)^4$. The 120-cell polytope times its structural constant, raised to its own dimension. $120 = 5! = 2^3 \times 3 \times 5$, pure sacred triangle primes. φ defines the 120-cell's vertex coordinates. The fourth power is the dimension (4 = L(3) = Hopf). A 4D object × its structural constant, raised to the 4th.

Square root (311 ppm):

$\sqrt{H_{21}cm}$	$F(14) \times 100$
37,688.27	37,700

$H_{21}cm \approx F(14)^2 \times 10^4$. And by the identity F(2n) = F(n) × L(n): F(14) = F(7) × L(7) = 13 × 29 = 377. Both algorithms at the same index (7 = L(4)), multiplied together. The Loom and the Weaving meeting at a Lucas-numbered index.

Cube root (802 ppm):

$\sqrt[3]{H_{21}cm}$	$3^2 \times 5^3$
1,124.098	1,125

$H_{21}cm \approx (3^2 \times 5^3)^3 = 3^6 \times 5^9$. Pure sacred triangle primes, no factor of 2.

Convergence

The geometric expression $(120\varphi)^4$ and the Fibonacci expression $F(14)^2 \times 10^4$ converge on each other to 16 ppm — closer to each other than either is to the actual hydrogen frequency. This follows from $(12\varphi)^4 \approx F(14)^2$, connecting the dodecahedron face count, the golden ratio, and the Fibonacci sequence through a single identity.

Part 7 — The Frequency Gala

Other Frequencies Through the Root Grinder

Systematic root decomposition of famous frequencies reveals hydrogen as the champion but not the only framework-encoded frequency.

Balmer Hα (656.28 nm, visible red hydrogen): The sixth root gives $106 \times \varphi^2$ to 17 ppm. So $\nu_{H\alpha} \approx (106\varphi^2)^6 = 106^6 \times \varphi^{12}$. The integer $106 = 2 \times 53$ lacks framework identity, but the precision is striking. Hydrogen speaking from a different transition.

CMB peak (~160.2 GHz): The fourth root gives 391φ to 48 ppm. Extraordinary precision, but $391 = 17 \times 23$ has no framework identity, and the CMB temperature is known only to ~210 ppm. The match is measurement-limited.

432 Hz (ancient tuning): Trivially framework: $432 = 2 \times 216 = L(3) \times 108 = \text{Hopf} \times \text{sacred}$. $f_0 \div 432 = 21.6$ MHz exactly. The "Verdi tuning" IS f_0 divided by Plato's Number doubled.

440 Hz (concert pitch): $440 = F(8)^2 - 1 = 21^2 - 1$. One short of framework perfection. The modern tuning standard is literally one Hertz away from the square of the 8th Fibonacci number.

Schumann fundamental (~7.83 Hz): Sits in the ELF range where $f_0 \div 10 = 10$ Hz and $f_0 \div 12 = 8$ Hz (via the 60^5 scaling). The Schumann resonance inhabits the lowest rungs of the framework ladder, where wavelengths match Earth's circumference.

The Verdict

Hydrogen remains the champion: three clean roots plus a unit-independent ratio ($Cs/H = 4\varphi$). The other frequencies show framework traces at varying precisions. All of them — hydrogen, Balmer, CMB, Schumann — are what f_0 produces when it encounters matter and geometry at different scales. They are the sand on the Chladni plate.

Part 8 — Plate and Sand

The Cymatics Interpretation

When a Chladni plate is vibrated, sand collects at the nodal lines — the places where the vibration cancels. The patterns in the sand encode the plate's geometry and frequency, but they are not the vibration itself. They are the residue. The consequence. What is left over after the vibration has done its work.

The measured frequencies of physics — H_{21}cm, Cs-133, the CMB peak, the Balmer series — are the sand. They are what the framework structure sounds like when it encounters matter. The hydrogen atom is not announcing the framework. The hydrogen atom IS what the framework looks like when it makes the simplest possible stable structure. The 21cm line is the disturbance pattern — the sound that structure makes when you perturb it slightly by flipping one spin.

f_0 is the plate.

Evidence for f_0 as Generator

Unique cleanliness. f_0 is the only frequency examined with pure {2,3,5} factorisation. Every subharmonic divides cleanly. 546 divisors, all smooth. No other physical frequency — not hydrogen, not caesium, not the CMB — shares this property.

Self-containing. The framework constants are already inside f_0. The sacred (108), the day (86,400), the precession (25,920), the year (360), Plato's Number (216) — all emerge as exact subharmonics. f_0 does not reference these constants; it contains them as paired reflections.

Shared skeleton. $f_0 = 45 \times 120^4$ and $H_{21}cm \approx \varphi^4 \times 120^4$. The 120-cell raised to the fourth power is the geometric core that both frequencies share. f_0 provides the Loom (integer) version; nature provides the Weaving (φ) version. The transformation from one to the other is the transformation from pure geometry to manifested matter.

Clock structure. In base-60, f_0 is 12:00:00:00:00:00. The entire subharmonic ladder is clock arithmetic — each division by 60 drops a digit, each division by 12 moves the hour hand. The electromagnetic spectrum from microwave to ELF is one clock face at different scales.

Physical absence. No known atomic transition sits at exactly f_0. This is not a weakness — it is the prediction. The plate does not appear in the sand pattern. The generator frequency is structural, not transitional. It is what the geometry vibrates at before physics introduces the golden ratio, the fine structure constant, and the proton's internal complexity.

Caesium proximity. The SI second is defined by Cs-133 at 9.193 GHz — 1.5% below f_0. Metrologists chose caesium for practical reasons (stability, reproducibility), without framework awareness. The fact that the most stable available atomic oscillator sits this close to the framework frequency suggests that caesium's transition is f_0 perturbed by the quantum mechanical complications of 55 electrons, 55 protons, and 78 neutrons.

What f_0 Is Not

f_0 is not a "broadcast frequency." It does not transmit information. It is not a signal to be detected.

f_0 is the structural vibration of the base-60 geometry itself — the clock rate of the Loom. The measured frequencies of nature are what this vibration produces when it passes through the Weaving (φ), through the fine structure constant (α), through the strong force (g_p), through all the layers of physical manifestation.

The framework frequency is not what the universe broadcasts. It is what the universe vibrates at before the broadcast begins.

Development Paths

1. **Unit dependence test** — $f_0 = 9{,}331{,}200{,}000$ Hz is defined in SI units. The STRUCTURE $2^{12} \times 3^6 \times 5^5$ is unit-independent, but the numerical value in Hz is not. Investigate what f_0 looks like in Planck units, atomic units, and natural units. Does the {2,3,5}-smoothness survive unit change?
2. **False positive test** — $f_0/H_{21}cm \approx 45/\varphi^4$ to 607 ppm. Generate random {2,3,5}-smooth numbers in the 1-10 GHz range and test whether they produce comparably clean ratios to $H_{21}cm$. If many do, the

relationship is not special

3. **Physical existence** — Confirm no known atomic or molecular transition sits at f_0. Search molecular databases for rotational transitions near 9.3312 GHz
4. **Base-60 coincidence quantification** — How many {2,3,5}-smooth numbers exist in the GHz range? How many have base-60 representations as clean as 12:00:00:00:00:00? Is f_0 special among smooth numbers, or typical?
5. **Caesium proximity test** — How many {2,3,5}-smooth numbers sit within 2% of any alkali metal hyperfine transition? Test against Rb-87 (6.835 GHz), K-40, Na-23 to determine if the Cs proximity is meaningful or expected
6. **The 120-cell investigation** — $H_{21}cm \approx (120\varphi)^4$ and $f_0 = 45 \times 120^4$. Do other 4D polytope numbers generate physical frequencies? Test $(24\varphi)^4$ (24-cell), $(600\varphi)^4$ (600-cell dual), $(8\varphi)^4$ (tesseract)
7. **The 46.5 ppm correction** — $Cs/H_{21}cm = 4\varphi \times (1 - 46.5 \times 10^{-6})$. The correction $\approx 0.87\alpha^2$. Investigate whether this is precisely the QED correction to the Fermi formula
8. **The proton g-factor** — g_p = 5.5857 from QCD. Best framework match: $L(4)\varphi/2 = 7\varphi/2 \approx 5.663$ (1.4%). Can g_p be expressed more precisely in framework terms?
9. **Cyclical age frequencies** — The Yuga durations (432,000, 864,000, 1,296,000, 1,728,000) are all f_0 subharmonics ÷ appropriate powers of 10. Map the complete Yuga system onto the frequency ladder
10. **Cymatics programme** — f_0 subharmonics in the audible range (f_0 ÷ large divisors) make specific cymatics predictions. At 360 Hz, 216 Hz, 108 Hz: what patterns form? Do they show the expected geometric symmetries?

This document is part of The Cosmic Clock For the Platonic analysis: The Timaeus and Critias (Parts 1-17) For the full framework: The Cosmic Clock Part VI (Expanded) For the Pythagorean mathematics: The Pythagorean Corpus For the Loom/Weaving analysis: The Loom and the Weaving For the cyclical ages: The Cyclical Ages For Plato's Number: Plato's Number