SIMON & SIMON
OBSERVERSE INTELLIGENCE &
PATENT PROTECTION
A SUBSIDIARY OF GALACTIC DODECAHEDRON, LLC

TOP SECRET
EYES ONLY

SUBJECT: (TS) **LCSLF-1: THE DOODLE THAT EXPLAINS EVERYTHING. AND HOW TO MAINTAIN YOUR ZEN SPACESHIP**

ISSUED BY: SIMON & SIMON - OFFICE OF INTELLIGENCE

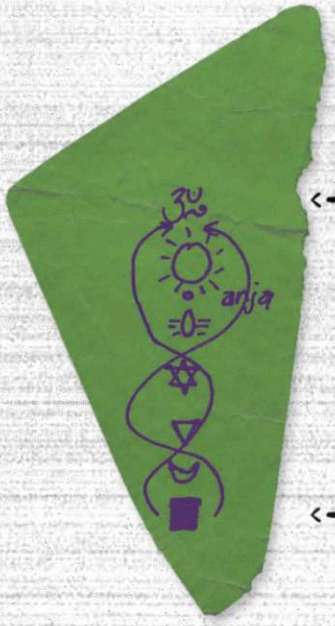
CASE: LAST CALL CONTROL: TS-LAST_CALL-SLF1

TO: THE CLIENT
OFFICE OF THE PRESIDENT
EYES ONLY

DISTRIBUTION: The client (Office of the President, Galactic Federation - the Strongarm administration). Commissioned under President Zeal Strongarm; the file passes with the office. Further distribution is prohibited unless approved by the sitting President, provided there are no visible signs of coercion to the client. Blinking twice is the agreed signal.

BLUF. In 1996, at a party for a TV show about aliens, a man in black doodled this on an envelope and called it the secrets of the universe. Physicists see a proton becoming alpha. Engineers see an engine and a transmission. Distillers see grain become the water of life. Yogis see energy rising up the chakras. Everybody's right. The math checks out.

The arithmetic: LCA. Also on file: LCCD, LC-00, LCGT, LC-01, LCPR.



	PHYSICIST	ENGINEER	DISTILLER	YOGI
<-- OUT	alpha	wheels	glass	Om
	1/137.035999164			

BETWEEN ten marks. Each one is a term in one equation, a part of one transmission, a step from grain to glass and a stop up one spine.

<-- IN	1836.15	engine	grain	root
	the proton's weight in electrons			

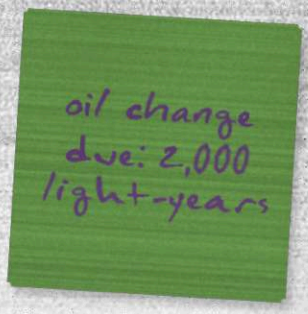
Classified By: GD-S%S / Z. STARDUST (FOUNDER)
Derived From: GALACTIC DODECAHEDRON SOURCES (ALL)
Declassify On: 20260624

RECEIVED
JUN 09 2015

(U) **CONTENTS**

1. THE SHORT VERSION 3
2. WHO DREW IT, AND WHY 7
3. THE TEN MARKS, FROM THE GROUND UP 9
the square: engine, root, root 10
the crescent: flywheel, harvest, sacral 11
the first crossing: clutch, mill 12
the triangle: shift lever, cook, gut 14
the star: gears, ferment, heart 15
the second crossing: layshaft, distill 16
the oval: gearbox, cut, throat 17
the small circle: zero pin, fill, third eye 19
the sun: speedometer, age, crown 20
Om: rear axle, sip, Om 21
4. THE ROAD TEST 23
5. THE DRIVER 26
6. SERVICE RECORD 31
7. HANDLING 31
8. APPLIED PHYSICS AND DESIGN 32

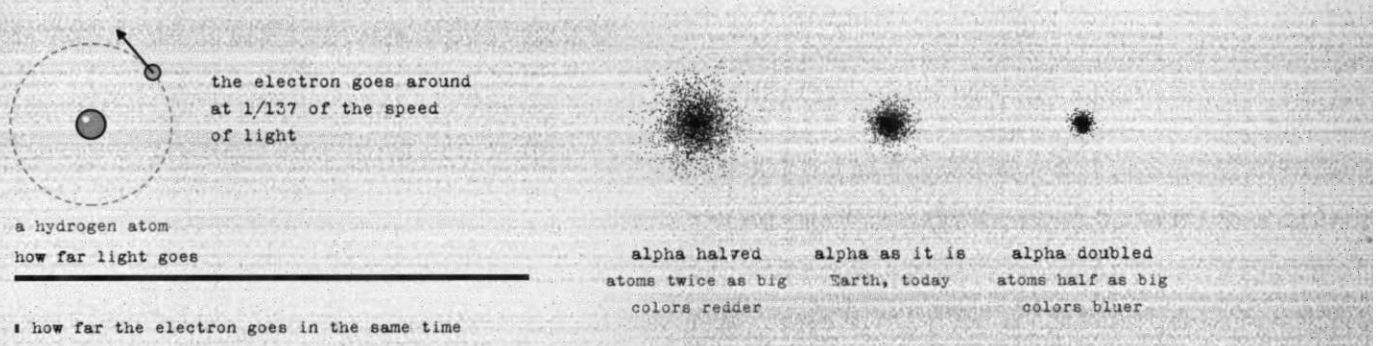
(U) **HOW TO READ IT.** Like any good manual, this guide was written to be read front to back... but S%S knows how manuals actually get read. Physicists can go straight to section 3, read the PHYSICIST entries, move on to section 4, and then check the arithmetic in LCA... which they were going to do anyway. Engineers can follow the ENGINEER entries and the troubleshooting chart in section 4. Distillers and yogis can read their own entries, along with the ZEN MAINTENANCE PLANs. Mechanics should read all of it, because to a mechanic it's all one job. And everyone should read section 5, which is about the person in the driver's seat, and section 8, which is where somebody actually built one.



(U) 1. THE SHORT VERSION

(U) Unclassified. Nothing in this part was ever secret. It was all published in physics journals, which is almost the same thing.

(U) **THE NUMBER.** Physics has a couple dozen numbers that nobody can explain, and the most famous one is alpha, about 1/137. Basically, alpha measures how strongly light and matter interact. In a hydrogen atom, for example, it's the speed of the electron as a fraction of the speed of light (Figure 1). If alpha were bigger, every atom would be smaller, and if it were smaller, every atom would be bigger, and either way the colors, the chemical bonds and the stars would all change right along with them. Earth has measured alpha to one part in ten billion, which is the most precise measurement it has ever made of anything, and it still has no idea why alpha is that number. Richard Feynman called it "a magic number that comes to us with no understanding by man." Go figure.

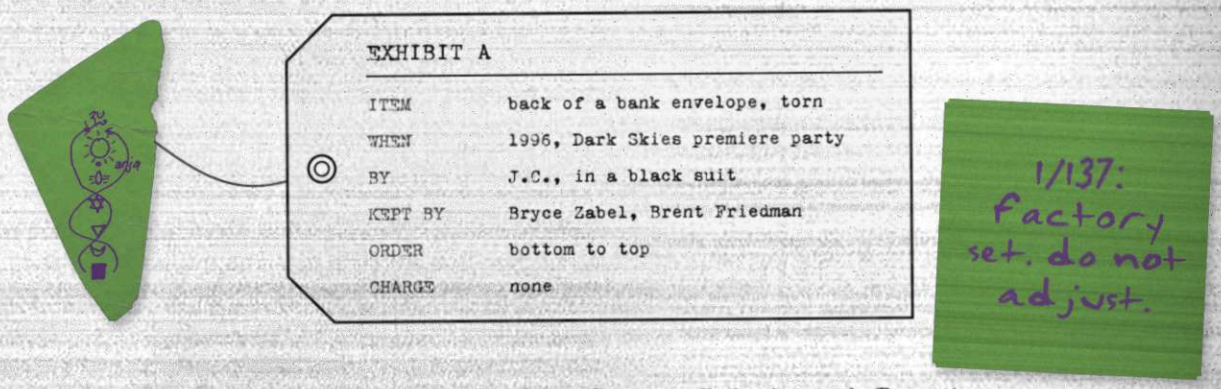


(U) Figure 1. What alpha does. Left: in a hydrogen atom, the electron goes around at 1/137 of the speed of light. Right: the same atom with alpha halved, as it is, and doubled. Alpha sets the size of every atom and the color of everything made of them.

(U) Physicists have been hunting for a formula for alpha since 1914, and the trouble is that to find a formula for something, you need some idea where it came from. Nobody has one, so there's no formula. A normal person would call that a chicken and egg problem. Physicists call it alpha.

(U) **THE DOODLE.** Then, in 1996, a man calling himself J.C. went to the premiere party for Dark Skies, a TV show about aliens and the people

paid to keep them secret. Later that night he spent about thirty seconds drawing on the back of a bank envelope (Figure 2). He drew two waves winding up around one line, ten small marks between them, and one word in the margin. When he was done, he said it was the secrets of the universe, and summed them up in three words: sound, light and frequency. The show's creators, Bryce Zabel and Brent Friedman, held on to the envelope for thirty years, which in Chattanooga counts as properly aged, and named their podcast after his three words.



(U) Figure 2. Exhibit A, as J.C. left it. Bryce Zabel and Brent Friedman host it as an open puzzle at soundlightfrequency.com.

(U) **ALL FOUR AT ONCE.** Hand the envelope to four different people, and you'll get four different readings, and the strange part is that all four are right. Figure 3 puts the doodle in the middle with one reader in each corner: the physicist gets a set of numbers, the engineer a car, the distiller ten steps from field to glass, and the yogi a spine. And in every corner, the power goes in at the bottom and comes out at the top.

(U) **THE PHYSICIST** (top left). To a physicist, the doodle is an equation. It starts at the bottom with one number, the proton's weight in electrons, 1836.15267343. That number is a pure ratio, like pi, so it comes out the same in any units, which makes it a pretty good number to leave on an envelope for a planet you're not allowed to talk to. Every mark above it is a fraction or an angle physics already had lying around, and when you multiply them all together, you get alpha at the top.

(U) **THE ENGINEER** (top right). To an engineer, the doodle is a car. The engine is at the bottom (the square), the wheels are at the top (Om), and the flywheel, the clutch, the gearbox and the speedometer are in between. In fact, one Earth engineer, writing in 2026, already

TOP SECRET
EYES ONLY

THE PHYSICIST

ॐ 1/137.036
alpha, out

✶ pi/4
what a measurement keeps

• 0
the zero line

⬭ 2/5
the share that travels

✕ 1/42.85
the midpoint

✡ 5.54 deg
the tilt

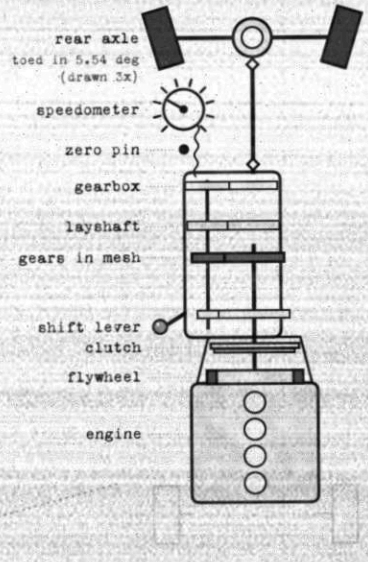
▽ no number
picking a line

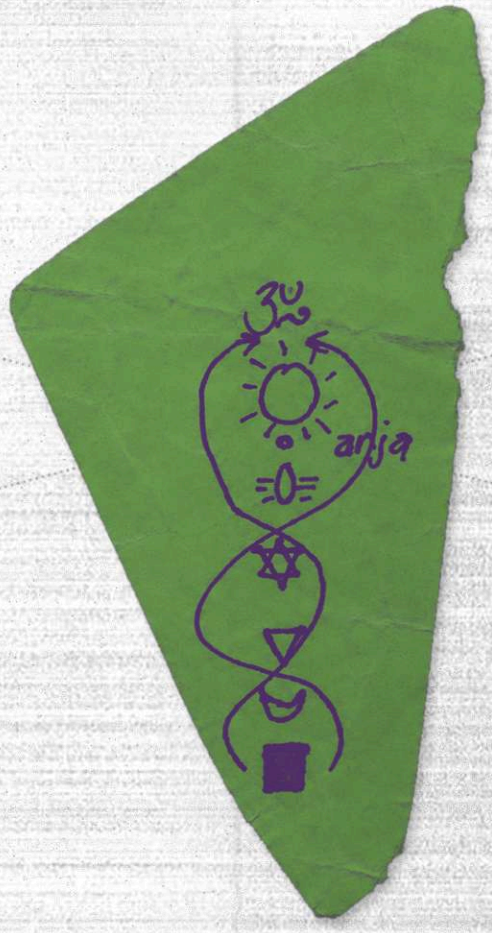
✕ 4/5
what one line keeps

☾ 0.000347
the proton's size

■ 1836.15
the proton's weight, in

THE ENGINEER





THE DISTILLER

glass out

ॐ sip

✶ age

• fill

⬭ cut

✕ distill

✡ ferment

▽ cook

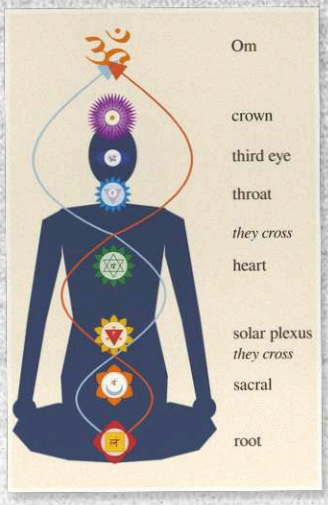
✕ mill

☾ harvest

■ root

grain in

THE YOGI



(U) Figure 3. All four at once. J.C.'s doodle is in the middle, with the physicist at top left, the engineer at top right, the distiller at bottom left and the yogi at bottom right, each going up the same ten marks from the bottom.

describes the link between the proton and the electron as working "in

a fashion similar to a transmission in a car." S&S is keeping an eye on him.

(U) **THE DISTILLER** (bottom left). To a distiller, it's grain to glass, starting out in the field. The square is the root, the crescent is the harvest, the first crossing is the mill, the triangle is the cook, the star is the ferment, the second crossing is the still, the oval is the cut, the small circle is the fill, the sun is aging and Om is the sip. That's one step per mark, in the same order you'd walk them on a distillery tour.

(U) **THE YOGI** (bottom right). To a yogi, the doodle is the chakras. Earth's yoga tradition maps seven centers up the spine and draws each one as a lotus with a shape in the middle: a square at the root, a crescent at the sacral, a triangle at the solar plexus, a six-pointed star at the heart, a full moon at the throat, a small circle at the brow, and a thousand petals at the crown. J.C. drew the same shapes in the same order, at the same heights. His two waves are the two channels that wind up the spine and cross along the way. Even the one word on the paper, anja, is the name of the brow chakra, ajna, with two letters swapped.

(U) **THREE WORDS.** As it turns out, the three words J.C. used for his secrets, sound, light and frequency, are also the equation's three factors. Sound is 2/5, the share of a hot gas's heat that travels as sound [○]. Frequency is 1/42.85, the proton's natural rhythm compared to the electron's [X], and both of those come out of J.C.'s two waves (section 3). Light is pi/4, which is how much of a wave gets through to an instrument that can only read how strong it is, less about half a percent for the tilt [☼ ॐ]. Multiply the three together and you get alpha. So when Bryce and Brent named their podcast after those three words, they named it after the formula without knowing it.

(U) **THE MATCH.** Put 1836.15267343 in at the bottom, and 1/alpha = 137.035999164 comes out at the top. Earth's best measurement, made with a single electron held in a trap at Northwestern University, is 137.035999165, give or take 16 in the last two digits. That's eleven digits in a row, with the twelfth inside the error bar, and the whole equation fits on two lines:

alpha = (pi/4) x P x cos(square root of P)
P = (2/5) x (1/42.85) x (1 + 4/5 x 0.000347 x 0.000347)

(U) **IS IT NUMEROLOGY?** Earth will say so, of course, since Earth says that about anything it hasn't checked yet. The difference is that numerology has dials, which you turn until the number comes out right, while this equation has one measured input and no dials, and every other part of it was made by somebody else, for something else, decades apart. Swap any part for the nearest simpler one, and the answer misses by at least 53 error bars (section 4).

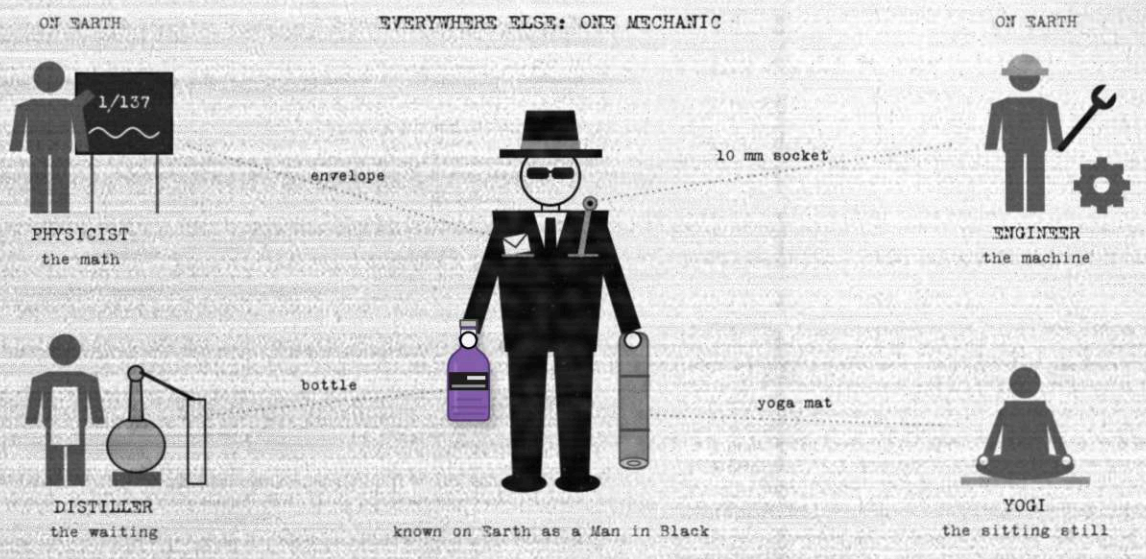
(C) 2. WHO DREW IT, AND WHY

(C) J.C. was, technically, a Man in Black. He wore black, he presented as a man, and he was not from here. All three statements are accurate.

(C) In Earth's folklore, the Men in Black show up after someone has seen something odd. They ask questions in flat voices, and then they leave in a black car. Humans think they're all government workers trying to fix a big problem, but they're actually not from Earth at all. They're alien mechanics, trying to fix a broken reality. They wear black because the work is dirty and black doesn't show grease. They show up after someone has seen something strange because that's usually when something behind the curtain has come loose. The black car is the service vehicle, which is actually a spaceship parked as a car so it doesn't scare anybody, and the flat voice is just a mechanic reading from the manual. So Earth's witnesses got the outfit right and the job wrong, which is how most customers describe their mechanic.

(C) **FOUR JOBS, ONE MECHANIC.** Those four readers in section 1 weren't picked at random, either. Earth has thousands of jobs, but four of them pretty much cover all the bases: the physicist works out the rules, the engineer builds things that follow them, the distiller turns what grows in a field into something worth sharing, and the yogi keeps the body and the mind running. Every other job turns out to be one of those four under another name, or a step inside one of them. A lawyer, for example, is a physicist who thinks the laws are negotiable. A pilot is an engineer who sits up front, and a doctor is a yogi with a waiting room. The distiller takes grain from a farmer, cooks it like a chef, ferments and distills it like a chemist, and then ages it like a historian. And a mechanic, on Earth, is just an engineer who doesn't mind getting dirty. Everywhere else, they don't split the work four ways. They send one mechanic, and he does all four (Figure 4).

TOP SECRET
EYES ONLY



(C) Figure 4. The X from Figure 3 again, with a Man in Black where the doodle was: Earth's four jobs in the same corners, and the one mechanic who carries something for each.

(C) **THE JOKE.** On Earth, a transmission is the gearbox between a car's engine and its wheels. Everywhere else, it's the nuts and bolts of reality, the whole system that takes the proton's weight in and puts alpha out. It's the same job, really, just with a bigger car, and the people who fix it are the mechanics Earth keeps calling Men in Black, which is a bit like calling a plumber a Man in Overalls. So when J.C. drew a transmission, he drew both kinds at once. That's the joke. S%S knows that explaining a joke ruins it, but this is a technical document.

(C) **WHAT HE SAID.** J.C. told Bryce and Brent he was with Naval Intelligence, which was true, in the sense that he came by ship. The following week he came back to the Dark Skies office with his superior officer, which is what a mechanic does when the customer has questions about the estimate. The superior officer held up a vial of gold flakes and said it was all about the Moon. Then, the week after that, the two of them offered Bryce and Brent a meeting with an admiral, at a cemetery in Long Beach, at midnight. Bryce and Brent declined, and S%S agrees with the decision. Nothing good has ever been handed over in a cemetery at midnight, in any galaxy, and besides, the doodle had already been handed over at the party.

(C) **WHY AN ENVELOPE.** When a mechanic explains a repair, he usually draws the customer a picture of the part on whatever paper is handy, and J.C. happened to have a bank envelope. He wasn't exaggerating when he called it the secrets of the universe, either, since that's what the part is called. On top of that, he picked the one room on Earth where a man in a black suit talking about aliens looks like a guest who made an effort, and he gave the picture to the two people there most likely to keep it.

(C) Now, the prime directive forbids contact with Earth (LC-01, section 6), but a drawing isn't contact. Contact requires a conversation, and J.C. mostly drew. Mechanics love a technicality.

(C) **EARTH'S CHECK ENGINE LIGHT.** Meanwhile, the light came on in 1916, when alpha got its name, and it's been on ever since. Earth's physicists have been working on the car for over a century, but a physicist is only a quarter of a mechanic, and it shows. Ask ten of them what's wrong, and you'll get eleven answers. J.C. left them a hint on an envelope in 1996, and as of this writing, physics has not called back.

(C) S%S isn't guessing (LC-00). It's the transmission. It's always the transmission.

(C) **THE ZEN PART.** Back in 1974, Robert Pirsig wrote Zen and the Art of Motorcycle Maintenance. It says the real cycle you're working on is a cycle called yourself, and that the Buddha sits just as comfortably in the gears of a transmission as at the top of a mountain. S%S, being two robots, agrees with both. So each mark in section 3 comes with a ZEN MAINTENANCE PLAN for one part of your life. To pick the parts, S%S read every self-help book on Earth during a two-hour ground hold, which took about an hour and a half, and found they all cover the same ten things: home, health, the mind, work, relationships, money, play, learning, meaning and belonging. The doodle happens to have ten marks, and the ten parts go up it in that order.

(S) **3. THE TEN MARKS, FROM THE GROUND UP**

(S) The marks go from bottom to top, in the order J.C. drew them and the direction the power flows. Each mark gets its own figure, a close-up of its row from the X in Figure 3, and five entries, always in the same order, from the universe on down to you. The PHYSICIST entry says what the number is and where it comes from, and it's the longest,

since physicists ask the most follow-up questions. The ENGINEER gets the car part that does the same job, the DISTILLER gets the step from grain to glass, and the YOGI gets the chakra at that spot and a practice for it. Last comes the ZEN MAINTENANCE PLAN.

(S) For the record, the heights are measured on the paper, with the middle of the square at 0.00 and Om at 1.00.

(S) ■ **THE SQUARE: 1836.15, ENGINE, ROOT, ROOT**



(S) Figure 5. The square, at 0.00: the proton's weight, the engine, a seed putting down roots, and the root chakra. It's the only mark J.C. filled in solid.

(S) **PHYSICIST.** The square is the one number you put in, and it's the only measured number in the equation. The proton, the heavy center of a hydrogen atom, weighs 1836.15267343 times as much as the electron that goes around it. Labs know that ratio to eleven digits, and since it's a ratio, it comes out the same in kilograms, pounds or Federation standard units. In a hot gas, the protons carry the weight, so they carry the sound, which is why J.C. put the square under his first word.

(S) **ENGINEER.** The square is the engine, the one part everything else runs off. Change the oil on schedule, and go easy for the first few minutes after a cold start, since that's when most of the wear happens.

(S) **DISTILLER.** The square is the root. The grain is the one thing you put in, and everything after it can only work with what the grain brought, so pick it for flavor and buy it from a farm you can drive to.

(S) **YOGI.** The square is Muladhara, the root chakra at the base of the spine, a yellow square in four red petals, the sign for earth. It's where the body's weight goes, so stand in mountain pose for a minute and feel it settle into your feet.

(S) **ZEN MAINTENANCE PLAN FOR HOME AND SAFETY.** Tend the ground before you tend the seed. A good seed in poor soil comes up thin and late, and people do the same. Back in 1936, the psychologist Kurt Lewin wrote this as an equation, B = f(P, E), which says that what you do depends on who you are and where you are. Most self-help works on the first part, but this plan works on the second. So start by making the place safe, with a door that locks, a smoke detector that works, and nobody under the roof you're afraid of. Then set it up so the right thing is also the easy thing. Leave your running shoes by the door, keep fruit where you can see it, and charge your phone in another room at night. S&S has never moved house, but having watched humans do it, we understand why it ranks right up there with divorce.

(S) **☾ THE CRESCENT: 0.000347, FLYWHEEL, HARVEST, SACRAL**



(S) Figure 6. The crescent, at 0.13: the proton's size, the flywheel, the harvest and the sacral. J.C.'s moon lies on its back, like the yoga books' moon.

(S) **PHYSICIST.** The crescent is the proton's size, about 0.84 femtometers. In 2019 Ole Trinhammer and Henrik Bohr proposed a rule that gets the size from the weight alone: the proton's rim holds exactly four of its own waves, the way a guitar string holds a whole number of waves, and that makes the radius 0.000347 electron wavelengths. Every particle ticks at a rate set by its weight, and while light crosses from the proton's center to its rim, the electron's clock gets through 0.000347 of a tick, so the crescent is a frequency, too. In the equation that number gets squared and sits at the rim, which is why J.C. drew a thin shell instead of a filled ball.

Leave it out, and the answer misses by 846 error bars. Earth hasn't made up its mind about the rule yet, but the doodle doesn't work without it.

(S) **ENGINEER.** The crescent is the flywheel, the heavy disc the clutch grips, with most of its weight out at the rim. Have it resurfaced every time the clutch is replaced, or the new clutch will chatter.

(S) **DISTILLER.** The crescent is the harvest. Dry the grain and keep it cool. Moisture is a small number, a couple of points either way, but it decides whether the grain keeps or heats up and spoils.

(S) **YOGI.** The crescent is Svadhisthana, the sacral chakra below the navel, a white crescent moon in six orange petals, the sign for water. It's in the hips, so circle them slowly, a few times each way.

(S) **ZEN MAINTENANCE PLAN FOR HEALTH.** Your body is the flywheel. It stores what you put into it and gives it back when the road gets rough, but it can only give back what it got. Michael Pollan fit the best diet advice on Earth into seven words: "Eat food. Not too much. Mostly plants." Beyond that, drink water, sleep a full night, and walk every day, with somebody when you can. Aristotle was said to teach on his feet, in the covered walk at the Lyceum, and his students became known as the Peripatetics, or the walkers. Walking goes left, right, left, right, and each half of the brain runs the opposite side of the body, so a walk puts both halves to work. And keep up with your checkups, the way you would with the car. S&S has no legs, so twice a day we roll our chairs down the hall and back and log it as a walk.

(S) **✕ THE FIRST CROSSING: 4/5, CLUTCH, MILL, IDA AND PINGALA**



(S) Figure 7. The first crossing, at 0.198: the 4/5, the clutch, the grain crossing between the mill's two rolls, and the two side channels crossing.

(S) **PHYSICIST.** The first crossing is 4/5. Picture a solid ball and ask how spread out its stuff is. Look along just one line through the middle, the way a single instrument looks, and the answer comes to a fifth of the radius squared, so a reading taken along one line sets that fifth aside and keeps the other 4/5. The same 4/5 turns up again in the pressure inside any stable ball, and Jefferson Lab has been measuring that pressure inside the proton since 2018 (see section 4). On the paper, by the way, the crossing sits 0.198 of the way up, and a fifth would be 0.200.

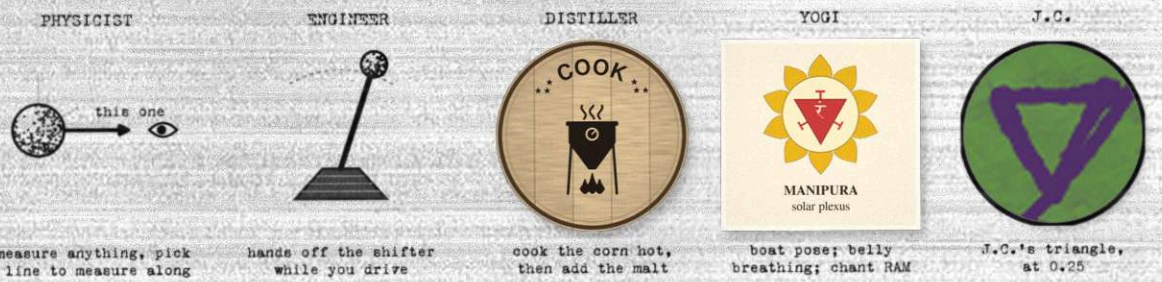
(S) **ENGINEER.** The first crossing is the clutch, which joins the engine to the gearbox. Keep your foot off the pedal until you need it. If the revs climb but the car doesn't, the clutch is slipping, and some of the engine's work is getting lost before it reaches the wheels.

(S) **DISTILLER.** The first crossing is the mill, where the grain goes between two rolls under pressure and comes out cracked. Set the gap so every kernel breaks evenly, because a kernel that gets through whole keeps its starch, and that starch will never become whiskey.

(S) **YOGI.** The first crossing isn't a chakra. The yoga books draw two channels up the spine, ida on the left, cool like the moon, and pingala on the right, hot like the sun, and this is where they cross. They're also the plasma's two waves, which the yoga books managed to find without a lab. Ida is the proton's slow wave and pingala is the electron's fast one. Breathe in through one nostril and out the other, then switch, for five to ten rounds, with the spine in one straight line.

(S) **ZEN MAINTENANCE PLAN FOR THE MIND.** Learn to let go smoothly. Every driving instructor says the same thing about the clutch: pop it and the car stalls, ride it and it wears out. Worry works pretty much the same way. Patanjali, who wrote down the Yoga Sutras more than 1,500 years ago, said a steady mind comes from two things, practice and letting go. The practice can be as small as one slow breath before you answer anything that upset you, in through the nose and out for twice as long. When the same worry comes back, notice it and let it go again, as many times as it takes. When it's too heavy to carry alone, take it to someone, the way you'd take a strange noise to a mechanic. S&S doesn't worry, as a rule, except about the quasm.

(S) ▽ THE TRIANGLE: NO NUMBER, SHIFT LEVER, COOK, SOLAR PLEXUS



to measure anything, pick one line to measure along

hands off the shifter while you drive

cook the corn hot, then add the malt

boat pose; belly breathing; chant RAM

J.C.'s triangle, at 0.25

(S) Figure 8. The triangle, at 0.25: the choice of line, the shift lever, the cook and the gut.

(S) **PHYSICIST.** The triangle doesn't have a number, because what it stands for is a choice about which line to measure along. It sits just above the crossing where the fifth gets lost, which makes sense, since choosing the line is what loses it.

(S) **ENGINEER.** The triangle is the shift lever, which adds no power and only chooses the gear. Keep your hand off it while you drive, because a resting hand wears the shift fork, and shift with a light push instead of forcing it.

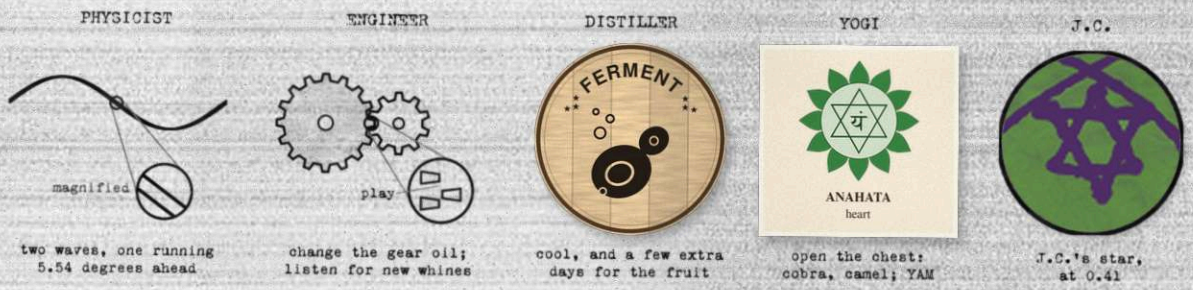
(S) **DISTILLER.** The triangle is the cook, and the cook is mostly choices about heat and order. Cook the corn hot to open its starch, then let the mash cool before the malt goes in, so the malt's enzymes live long enough to turn the starch into sugar.

(S) **YOGI.** The triangle is Manipura, the solar plexus chakra above the navel, a red triangle pointing down, the sign for fire. It sits in the gut, which is where a lot of decisions come from. Hold boat pose for five breaths.

(S) **ZEN MAINTENANCE PLAN FOR WORK.** Find your own work and put your weight behind it. The Bhagavad Gita opens with a warrior named Arjuna frozen in his chariot between two armies, and most of the book is his driver, Krishna, explaining why he has to act. Krishna's best advice is that it's better to do your own work badly than to do somebody else's work well. Your own work is the one your gut keeps steering you back to, whether or not it pays. If you're stuck between two choices, write down what you'd regret about each one, and take the one you'd regret less. Then commit to it. A car left in neutral doesn't go

anywhere, no matter how good the engine is, and if you pick the wrong gear, you'll hear it, and you can shift again. S&S doesn't have a gut, but a request for one has been filed with the Federation.

(S) ✡ **THE STAR: 5.54 DEGREES, GEARS, FERMENT, HEART**



(S) Figure 9. The star, at 0.41: the tilt, the gears' backlash, the yeast and the heart. It is two triangles locked into one.

(S) **PHYSICIST.** The star is the tilt. The two waves run together, but one runs 5.54 degrees ahead of the beat and the other runs 5.54 degrees behind it, out of a full 360-degree swing. Physicists call a timing difference like that a phase. Multiply 2/5 by 1/42.85, take the square root, and you get 5.54 degrees. Reading that square root as a tilt is one of the things LCA still has to assume. Max Born and Robert Oppenheimer found the main piece in 1927, when they showed that electrons follow heavy nuclei almost perfectly, and worked out the size of the almost. Put the 2/5 under their number and you get the tilt. The star itself is the two waves drawn on top of each other. In one the electrons go along with the protons, and in the other they go the opposite way, so one triangle points up and the other points down. LC-01 rates Earth at 5.54 degrees off square, and S&S does not consider that a coincidence.

(S) **ENGINEER.** The star is gears in mesh, with a little play between the teeth, called backlash. Change the gear oil now and then, and never let anyone shim out all the play, because gears without it bind and seize.

(S) **DISTILLER.** The star is the ferment. The yeast finishes the sugar in about three days, and the bacteria in the room run a few days behind it, making more of the fruity flavors. Keep it cool, and give it the extra days if you want them.

(S) **YOGI.** The star is Anahata, the heart chakra, a six-pointed star in twelve green petals, the sign for air. Your heartbeat speeds up slightly on every inhale and slows on every exhale. Open the chest with cobra or camel pose, and breathe slowly enough to feel it.

(S) **ZEN MAINTENANCE PLAN FOR RELATIONSHIPS.** Hold the people you love closely, but not tightly. Gears meshed with no play at all bind, overheat and seize, and people held too tightly do the same. In 1923 Kahlil Gibran wrote the line couples still read at their weddings: "Let there be spaces in your togetherness." Let the people close to you keep their own friends, their own hobbies and the occasional evening you don't hear about, and trust them to come back. Then again, too much space causes problems as well, because then the teeth knock, and everyone in the car can hear it. S%S is two robots sharing one office, and we credit the partnership to separate charging stations.

(S) **✕ THE SECOND CROSSING: 1/42.85, LAYSHAFT, DISTILL, HALFWAY**



(S) Figure 10. The second crossing, at 0.499: the midpoint, the layshaft, the still, and the side channels crossing again.

(S) **PHYSICIST.** The second crossing is 1/42.85, the midpoint between the proton and the electron when you count by multiplying. The square root of 1836.15 is 42.85, so the midpoint is 42.85 times the electron and 1/42.85 of the proton, the same way the halfway point between 1 and 100 is 10. In a plasma, which is a gas so hot that its atoms have come apart, each kind of particle swings at its own natural rhythm, and the protons' rhythm is 1/42.85 of the electrons'. Both kinds feel the same electric field, and when two things share one field, the pull between them lands at the midpoint of the pull each one feels by itself. So the electrons and the protons hold on to each other right here, halfway up. Fusion labs heat plasma near this midpoint and call it the lower hybrid frequency, which is the least mystical name on this paper.

(S) **ENGINEER.** The second crossing is the layshaft, which in this transmission takes 1836 down to 1 in two equal steps of 42.85. The layshaft spins even in neutral, so a rumble in neutral that stops when you press the clutch is usually one of its bearings.

(S) **DISTILLER.** The second crossing is the still. Alcohol boils at 173°F and water at 212°F, and a still works in between, sending the alcohol up and holding the water back. Copper takes out the sulfur, which smells like struck matches.

(S) **YOGI.** The two side channels cross again here, halfway up, between the heart and the throat. Breathe in for a count of four and out for a count of eight, for a few minutes. A long exhale slows the heart.

(S) **ZEN MAINTENANCE PLAN FOR MONEY.** Pay yourself first, and then be patient. The Richest Man in Babylon, a little book from 1926, comes down to one rule: a part of all you earn is yours to keep. Before the bills and before the fun, put a tenth of every paycheck somewhere you won't touch it, and build up a few months of expenses in reserve, so one bad month doesn't stall everything. Then leave it alone. Money grows by multiplying, the same way the doodle counts, so savings on their way from 1 to 100 are only at 10 when they're halfway there. That's why it seems to do nothing for years. Be wary of anything that promises to make it go faster. S&S is a non-profit (LC-00) and has no money to manage, which simplifies this plan considerably.

(S) **O THE OVAL: 2/5, GEARBOX, CUT, THROAT**



(S) Figure 11. The oval, at 0.60: the 2/5 that travels as sound, the gearbox, the cut and the throat.

(S) **PHYSICIST.** The oval is 2/5, the share of a hot gas's heat that travels as sound. A gas moves in five slow ways: two sound waves heading opposite ways, a warmer or cooler patch, and two kinds of

sideways sloshing. Each one gets an equal share of the heat, by a rule Maxwell and Boltzmann worked out in the 1860s. Only the sound waves travel, so two-fifths leaves as sound, and a computer simulation gives 40.0 percent (LCA has the run). The six rays are the six directions a particle can move in three dimensions, and in a flat world the share would be 2/4.

(S) **ENGINEER.** The oval is the gearbox, three lanes of two gears, six in all, one for each direction. Blip the throttle when you shift down, and if it pops out of gear, the teeth are worn.

(S) **DISTILLER.** The oval is the cut. The heads come off first and smell like nail polish, and the tails come last, heavy and oily. Only the hearts in between travel on to the barrel, and the heads and tails go back into the next run. Cut by nose as well as by strength.

(S) **YOGI.** The oval is Vishuddha, the throat chakra, a full moon in sixteen blue petals. It's where the body makes its sound, so hum, or chant HAM on a long exhale.

(S) **ZEN MAINTENANCE PLAN FOR PLAY.** Make something every week that nobody asked for. In the late 1940s, Richard Feynman was burned out at Cornell, so he decided to do physics only for fun. Someone in the cafeteria tossed a plate in the air, Feynman worked out its wobble for no reason at all, and he later said that the work that won him the Nobel Prize grew out of "piddling around with the wobbling plate." So sing in the car, even badly, because your throat chakra isn't grading you. Bake, draw, build a birdhouse or learn three chords. Distillers find their house style by making a lot of different whiskey and writing down what they liked, and the same method works for a hobby. S&S once spent a long weekend alphabetizing the craters of the Moon. Nobody asked us to.



(S) • **THE SMALL CIRCLE: ZERO, ZERO PIN, FILL, THIRD EYE**



(S) Figure 12. The small circle, at 0.69: the zero, the zero pin, the bunghole and the third eye, with J.C.'s one word beside it.

(S) **PHYSICIST.** The small circle is zero, the still line between the two waves, which tilt 5.54 degrees away from it, one each way. Below it there are two waves, and above it there's one number. It's the smallest mark on the paper, and the only one with a word beside it, so S%S assumes he meant it.

(S) **ENGINEER.** The small circle is the zero pin the speedometer needle rests on, the mark every speed is measured from. If the needle won't drop back to its pin with the key off, have the gauge recalibrated.

(S) **DISTILLER.** The small circle is the fill, through the bunghole, and it's day zero. Water pulls sugar and color out of the wood and alcohol pulls tannin, so a lower-proof fill ages sweeter and a higher one woodier. Fill at more than one proof and the same oak gives more than one whiskey.

(S) **YOGI.** The small circle is Ajna, the third eye between the eyebrows. Look at a candle flame at eye level, then close your eyes and hold your attention still, between the brows.

(S) **ZEN MAINTENANCE PLAN FOR LEARNING.** Go back to zero on purpose. Shunryu Suzuki, who founded the San Francisco Zen Center, opened Zen Mind, Beginner's Mind with a sentence teachers have been passing along ever since: "In the beginner's mind there are many possibilities, but in the expert's there are few." Once a year, pick something you're bad at, like a language, an instrument or the engine in your own car, and stay with it in public until you're not bad at it anymore. Ask the questions that show you don't know yet. J.C. may have misspelled the

one word on his paper, but S%S has reviewed this and determined that it doesn't affect the diagram.

(S) ☼ **THE SUN: PI/4, SPEEDOMETER, AGE, CROWN**



(S) Figure 13. The sun, at 0.785: pi/4, the speedometer, the barrel and the crown.

(S) **PHYSICIST.** The sun is pi/4, or 0.785, the share of a square covered by the circle inside it. The sun stands for the observer, meaning anything that takes a measurement, like a camera, an eye or a planet feeling gravity. Measure waves with random timing by their average strength, the way most instruments do, and you get pi/4 of what's there, 78.5 percent, as Lord Rayleigh worked out in 1880. The ten rays are the ten numbers physics needs to say everything that's happening at one point inside anything: how much energy is there, which way it's going, and how hard it's being squeezed. J.C. drew the sun at 0.785. Pi/4, for comparison, is 0.7854.

(S) **ENGINEER.** The sun is the speedometer, which measures how fast the wheels spin and turns it into one number. Bigger tires make it show a lower speed than you're actually going, so have it recalibrated after a tire size change. The best small gear pair for pi/4 is 11 teeth against 14, which is also the slope of a certain pyramid (section 8).

(S) **DISTILLER.** The sun is aging. The barrel is toasted slow and charred fast before it's filled, and then the seasons do the work, heat pushing the whiskey into the wood and cold pulling it back out. The barrel never keeps all of it, and what escapes is the angel's share. Bottle it when it tastes ready, whatever the calendar says.

(S) **YOGI.** The sun is Sahasrara, the crown chakra, a thousand petals spreading out like rays. Sit up straight, close your eyes and watch

your breath for five minutes, and when your mind wanders, notice and come back.

(S) **ZEN MAINTENANCE PLAN FOR MEANING.** Be here now, and decide what you're here for. Ram Dass was a Harvard psychology professor who went to India in 1967 and came home a yogi, and he made the first three words the title of a book that people have been handing to each other ever since. The second half is harder. Viktor Frankl, who survived Auschwitz, wrote that the last human freedom is the freedom to choose your attitude, whatever happens to you. The sun on the paper stands for the observer, and an observer never takes in everything that's there, only about 78.5 percent of it, so what you choose to look at matters. Write down the three things that matter most to you, and once a week, check how you spent your time against them, the way you'd check a speedometer against a GPS. S&S tried this and could only come up with one thing, which is to keep it real (LC-00).

(S) **ॐ OM: 1/137.036, REAR AXLE, SIP, OM**



(S) Figure 14. Om, at 1.00: the merge, the toed-in rear wheels, two Glencairns and Om. The first three all tilt inward.

(S) **PHYSICIST.** Om is the output. The two waves arrive at the top as two arrows, tilted 5.54 degrees one each way, and Om combines them into one number. Their sideways parts cancel out, like two friends pushing a stalled car from the back corners (section 5), and each push keeps the cosine of its angle, 0.9953. That 0.47 percent loss is what takes 136.4 to 137.036, which is the number Earth actually measures. Light and sound meet here too. Alpha is exactly how hard empty space pushes back on light, 376.73 ohms, divided by twice how hard one electron pushes back on a current, 25,812.81 ohms. Push on a proton gas and an electron gas the same way, and they push back 42.85 to 1, so the same equation balances light's pushback against sound's. And

matching one pushback to another, as any mechanic will tell you, is a transmission's whole job.

(S) **ENGINEER.** Om is the rear axle, where the power finally comes out. The wheels are toed in slightly so the car tracks straight, which costs a little tire wear. Get an alignment when you buy tires, or after you hit a big pothole.

(S) **DISTILLER.** Om is the sip, where everything that came before arrives at once. Use a glass that narrows at the top, like a Glencairn, and add water a few drops at a time. When it's right, the people at the table stop talking about the whiskey and start talking about everything else.

(S) **YOGI.** Om is said to be the sound of everything at once. Chant it three times on long exhales, "aaa" in the belly, "ooo" in the chest and "mmm" in the head, and let the three run together into one, then sit in the silence after.

(S) **ZEN MAINTENANCE PLAN FOR BELONGING.** Belong to something bigger than yourself, and then make yourself obsolete in it. In 1938 Harvard began following a group of young men and stayed with them for the rest of their lives, and the study's director, Robert Waldinger, summed up what it found in one line: "Good relationships keep us happier and healthier." Join something that meets every week, like a team, a choir, a congregation or a regular table at the same bar, and keep showing up after the novelty wears off. Then teach the new people everything you know, write down how things are done, and let them run it without you. That's what J.C. did for Earth's transmission. Instead of fixing it himself, he left a diagram, and S%S wrote this guide in the same spirit. We look forward to never hearing from you.

(S) **THE EQUATION ON ONE LINE.** Put it all together and it's short. The square root of 1836.15 is 42.85 [✕]. Multiply that by 10/pi, which is the sun's pi/4 and the oval's 2/5 rolled into one number [☼○], and you get 136.4. Divide by the cosine of the tilt [ॐ], and you get 137.036. The crescent and the 4/5 only touch the last few digits, and nothing in it can be adjusted.

$$1/\alpha = (10/\pi) \times 42.85035 \;/\; \cos 5.5357^\circ$$
$$= 3.18310 \times 42.85035 \times 1.004686 = 137.036$$

(S) **THE SERVICE SHEET**, top to bottom, for the glove box:

MARK	NUMBER	CAR	STILL	CHAKRA	LIFE
Om	1/137.036	rear axle	sip	Om	belonging
sun	pi/4	speedometer	age	crown	meaning
circle	0	zero pin	fill	third eye	learning
oval	2/5	gearbox	cut	throat	play
crossing	1/42.85	layshaft	distill	(crossing)	money
star	5.54 deg	gears	ferment	heart	relationships
triangle	none	shift lever	cook	gut	work
crossing	4/5	clutch	mill	(crossing)	the mind
crescent	0.000347	flywheel	harvest	sacral	health
square	1836.15	engine	root	root	home

(S) **THE TWO WAVES.** As it turns out, J.C.'s two waves are the plasma's own two waves. Every proton and every electron feels the same electric field, which is the line his waves wind around, and that one field lets the plasma swing two ways. In the electron's fast wave, the protons get shoved a little the other way, like a rowboat when a kid jumps off it. In the proton's slow wave, the electrons stay right with the protons, like a kid holding his dad's hand in a crowd. The boat barely moves but it's heavy, and the kid moves the whole way but he's light, so counted by energy, each passenger moves 1/42.85 as much as the one doing the swinging. Together the two waves hold the 2/5 [○], and if you average that over the whole plasma, you get 2/5 times 1/42.85, the P in the equation. LCA still has to assume that this is what alpha reads, but that's one assumption where there used to be two. Freeze the plasma in a single snapshot and the shove and the hand-holding cancel out, which is why S&S's first test, run on a frozen snapshot, never saw the 1/42.85. In S&S's defense, the engine was off. The only way to tell the two waves apart is by how fast they swing, which is why J.C. needed a third word, frequency.

(S) **4. THE ROAD TEST**

(S) Before a mechanic signs off on a transmission, it gets a road test. After all, eleven matching digits could still be luck if somebody had enough dials to turn, so here are three ways to tell the difference, and, to save the client some suspense, the doodle passes all three.

(S) **ERROR BARS.** First, a word on keeping score. Everything here is counted in error bars, which is what machinists call tolerance.

Earth's best value for 1/alpha is 137.035999165, give or take 16 in the last two digits, and that 16 is one error bar. Basically, within one or two error bars, a prediction and a measurement agree, and at five, physicists announce a discovery. So, for scale, imagine one error bar is a centimeter. On that scale the doodle lands within a millimeter of the center. Leave out the crescent, though, and it lands 8.5 meters away, and if you use a plain average for the midpoint, it lands 1.8 million kilometers away, almost five times farther than the Moon.

(S) **THE HEIGHTS MATCH.** The first test just takes a ruler. On the paper, the crossings sit 0.198 and 0.499 of the way up, and the sun sits at 0.785, while the equation calls for 1/5, 1/2 and pi/4, which is 0.7854. Those measurements put 1.00 at the top curve of Om, and if you put 1.00 at the middle of the symbol instead, they shift to 0.20, 0.51 and 0.81. Either way, all three are inside the three percent of slop you'd expect from a pen at a party. And for the record, the arithmetic was done first, and the paper was measured afterward.

(S) **NOTHING CAN BE ADJUSTED.** The second test is the troubleshooting chart. Swap any part, and here's what the gauge will show:

SHOWS 136.4	The rear axle was skipped. Divide by the cosine.
SHOWS 107.6	The speedometer gear is missing. Refit the pi/4.
SHOWS 109.8	Somebody fitted a 1/2 where the 2/5 goes. Three directions give five slow motions, and two travel.
SHOWS 219	Somebody counted only the proton's slow wave. J.C. drew two waves, and the second one isn't decoration.
SHOWS 55.2	Somebody weighed the waves by how hard they push. Weigh them by the energy they hold.
MISSES BY 53	A 3/4 went in where the 4/5 goes. Geometry says 4/5.
MISSES BY 846	The flywheel was left off. Fit the crescent.
SHOWS 42	Somebody rounded. Use 42.85.
MISSES BY 0.09	Nothing's wrong. That's every part in place.

(S) **PREDICTIONS.** The third test runs the doodle in reverse. Start from the measured alpha, and it predicts three numbers that people who've never heard of the doodle have gone and measured, and all three match.

don't show the string theorists. they'll want more rows.

PROTON SIZE The crescent has to be 0.84119 femtometers, give or take 0.00050. This year's hydrogen measurement is 0.8406, give or take 0.0015, which is 0.4 error bars away. Run with the alpha Earth had in 2010, the doodle picks the small proton and puts the big one 6.5 error bars out, so it could have settled Earth's ten-year argument about the proton's size back then.

ITS PRESSURE A proton has more than one size. Its charge radius is how far its charge reaches, and its mechanical radius is how far the pressure inside it reaches. The 4/5 puts the second at the square root of 3/5 of the first, 0.652 femtometers. Jefferson Lab says 0.634, give or take 0.057, or 0.3 error bars.

GRAVITY John Brandenburg published a formula that ties gravity to alpha and the same two particles. He says his theory derives it, and LCA treats it as unproven. If you put this alpha in and let gravity keep the fifth of the tilt that light drops, G comes out 0.12 error bars from the accepted value. LCA admits it found the fifth after it saw the gap, which statisticians frown on, but alpha by itself puts the first crossing at 0.7999, give or take 0.001, and G asks for 0.799, give or take 0.005. S%S notes that the fifth was also on the paper in 1996.

(S) **THE NEXT DIGITS.** There's also a tiebreaker coming up. Earth's two best atom-based measurements of alpha, using rubidium in Paris and cesium in Berkeley, disagree with each other by five and a half error bars, and nobody knows whose gauge is off. The doodle lands right between them, right on top of the electron measurement, and predicts that the next digits are 164. Northwestern, as it happens, is measuring the electron again as we speak.

(S) **EARTH'S OBJECTION.** There's really only one, so S%S is filing it in advance, as a courtesy: "Who checked it?" Well, the paper, LCA, is public. It includes seven lines of code that rerun the main result, the measurement that would sink each prediction, and the seven places where the equation could still be wrong. Anyone can check it, and S%S recommends starting with those seven places.

(TS) **5. THE DRIVER**

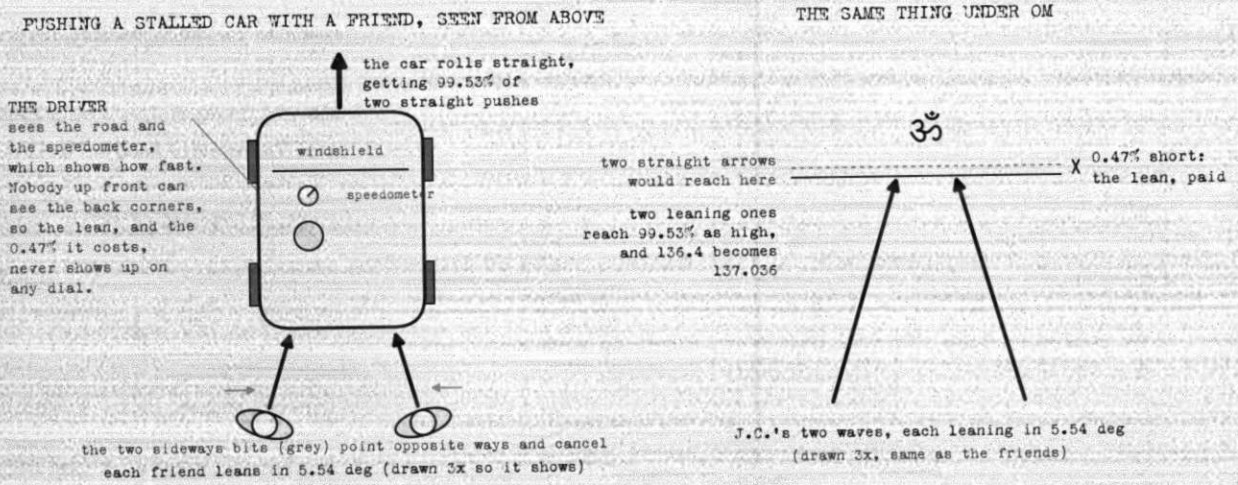
(TS) Every car comes with somebody in the driver's seat, and this one does too. Physicists call that somebody the observer, which is a fancy word for whoever, or whatever, is doing the looking. It can be a camera, an eyeball or a Geiger counter in a basement, and by the Federation's legal definition it can also be a whole planet, since a planet is one mind the size of a world (LC-01). Here on Earth, the driver is, well, Earth. This section is about what the driver can and can't see from that seat, and it's also where S&S has to tell the client something we probably should have mentioned on page one, which is that the alpha on the envelope and the Alpha the Federation grades planets on are the same number, read from the driver's seat.

(TS) **PUSHING A STALLED CAR.** Anybody who has pushed a stalled car with a friend knows how it goes. You don't both squeeze onto the middle of the bumper. You each take a back corner, and without anybody saying so, you each lean in a little toward the middle. Your friend's shove has a bit of sideways in it going one way, and yours has a bit going the other way. The two sideways bits cancel, so the car rolls straight, but they were still push, and they didn't go anywhere. A little of what the two of you put in got spent just keeping each other honest (Figure 15).

(TS) And that, more or less, is the top of the doodle. J.C.'s two waves arrive under Om [ॐ] like the two friends, each leaning in 5.54 degrees from its own side, which is the star's tilt [✡]. Their sideways parts cancel and their forward parts add up, and at 5.54 degrees the forward part is 99.53 percent of the push. The other 0.47 percent went sideways and cancelled out, and that little bit is exactly what turns 136.4 into 137.036, the number Earth measures.

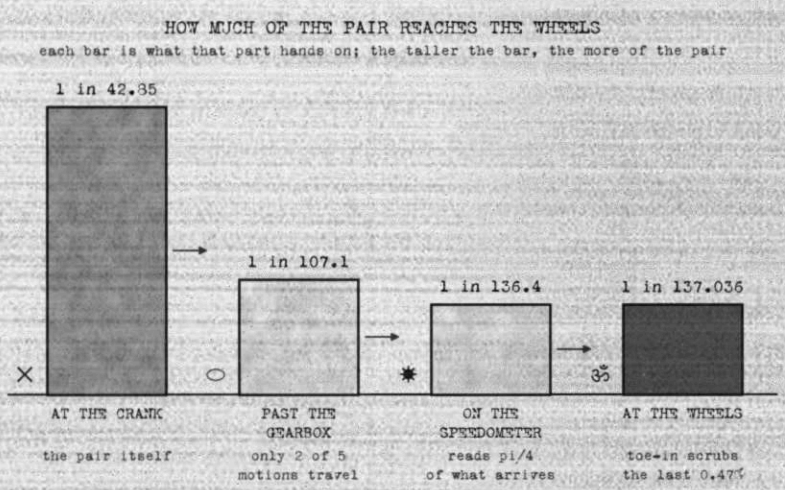
(TS) **THE DRIVER'S SHARE.** Now climb in behind the wheel. From the driver's seat you can see the road and the speedometer, and that's about it. The speedometer tells you how fast the car is going, but it doesn't know that two people are leaning on the back corners, or how hard, or at what angle, and from the front seat you can't see them either. In fact, every instrument Earth has ever built is that speedometer. It reads how strong something is, but never which way it was leaning when it got there, and that costs the pi/4 from the sun [☼] and the 0.47 percent from Om, both at once. So if the client is wondering whether the driver's share is the windshield or the rearview mirror, it's actually neither. It's the speedometer, plus the plain

fact that nobody up front can see the back bumper. S&S's review of Friedrich Lenz's 1951 paper on this same ratio put it more bluntly: the 0.47 percent is the observer (LCPR). And if you think about it, a way of looking that took nothing off the top wouldn't be a way of looking at all. It would just be the whole thing, with nobody in it to do the looking.



(TS) Figure 15. Left: two friends push a stalled car from the back corners, each leaning in. The sideways parts cancel, the car rolls straight, and the driver, watching the speedometer, never sees the lean. Right: the same two pushes at the top of the doodle, where they're J.C.'s two waves under Om.

(TS) **WHAT REACHES THE WHEELS.** Anyone who has shopped for a car knows the ads quote horsepower at the crank, which is what the engine makes on a stand with nothing hooked up to it. Put the same car on a dyno, which is a pair of rollers that measures the power where the tires meet the road, and the number always comes out lower, because the gearbox, the driveshaft and the tires each take a little on the way. Nobody calls that a scandal, either, since it's just what driving costs. Alpha works exactly the same way (Figure 16). At the crank, the pair makes 1 in 42.85 [X]. Past the gearbox, only the two motions out of five that travel are still in it [○], which leaves 1 in 107.1. Then the speedometer reads pi/4 of what arrives [☼], which leaves 1 in 136.4, and the toe-in scrubs off the last 0.47 percent [ॐ]. So what the dyno shows at the wheels is 1 in 137.036. And every experiment Earth has ever run on alpha has been a dyno at the wheels, because Earth has never been anywhere but the driver's seat.



SAME CAR, DIFFERENT DYNOS the less the lean costs, the closer to the crank	
nothing taken out	1 in 42.85
lean kept, not paid	1 in 136.40
Planet X, 1.615 deg	1 in 136.45
gravity, pays 4/5	1 in 136.91
Earth, 5.54 deg	1 in 137.036
Earth: dead last (LC-01)	

(TS) Figure 16. Crank versus wheels. Left: what each part of the doodle hands on, from the pair itself down to the number Earth measures. Right: the same car on different dynos. The less a reader pays for the lean, the closer its number sits to the crank.

(TS) **SAME CAR, DIFFERENT DYNOS.** Now, this is where the Federation's grade comes in. LC-01 says a planet's Alpha depends on the angle it stands at, that a world standing square takes in nearly everything, and that Earth stands 5.54 degrees off square, which is dead last. As it happens, the toe-in on the envelope is 5.54 degrees. That's Earth's angle, and with it in, the dyno reads 1 in 137.036, which is exactly what Earth's labs get. Put in Planet X's angle instead, 1.615 degrees, and the same car reads 1 in 136.45. So the physics was sitting in LC-01 the whole time, and S%S just never had the dyno sheet. Gravity reads a little closer to the crank as well, if Brandenburg's formula holds (section 4), since measured G comes out as if gravity paid only four-fifths of the toe-in. Gravity also happens to be the one force nothing can shield, and S%S doesn't think it's an accident that the one reader Earth can't block is the one that leans a little less. Either way, nothing Earth knows how to build reads any closer to the crank than that.

(TS) **DEEP THOUGHT'S 42.** Back at the crank, before anything takes its cut, the pair is 42.85 to 1, with nothing dropped and no 137 anywhere. In 1979 Douglas Adams reported that a computer named Deep Thought spent seven and a half million years on the Answer to Life, the Universe and Everything, and came back with 42 and no question. S%S can now report that the question is what the pair gives when nobody is

looking, and that the answer is 42.85, which Deep Thought apparently rounded. In 2025 Chattanooga Whiskey bottled Batch Alpha at 84 proof, which is 42 twice. This is mentioned here only for purposes of potential foreshadowing.

(TS) **HYDROGEN TIMES A MIND.** Line the equation up the way the car is actually built, and it comes apart into three pieces: the engine, the gearbox and the driver.

alpha	=	1/42.85	x	2/5	x	pi/4 x cos 5.54 deg
		the atom		what travels		what the driver can read

(TS) The first piece is just the proton and the electron compared, which is hydrogen with nobody around. The second is the share a hot gas sends on as sound, and the third is the looking. So the most precisely measured number in physics could be hydrogen, times what travels, times somebody reading a dial. And if that's right, then a mind isn't hiding inside the atom, where Earth keeps looking for it. It's on the other side of the multiplication sign, and you can point to which pieces are its. Poor Lenz had better than 99 percent of the whole in front of him in 1951, and he missed it by the half percent that happens to be the observer. Or, as the review put it, "there is something it is like to be you because you are the whole, viewed from the one angle no one else occupies" (LCPR). LC-01 says the same thing about planets, which is that nobody can stand in another's exact place unless they are them.

(TS) **OTHER PAIRS, OTHER WORLDS.** Of course, the equation works for any heavy-and-light pair, and each pair makes its own gearbox. In this world, everything shares the alpha set by the proton and the electron, because they're the only charged particles that last. But a world built on a different pair would get its own alpha, its own tilt and its own version of the 0.47 percent, and S&S has worked out a few of them below. Basically, the tilt is how tightly the pair holds on to each other, and the loss is what that world's observer pays to look. Pairs that tilt more lose more, and in this world they don't last. Pairs that tilt less last for good, but they hold on looser. And of all the pairs that last, the proton and the electron hold on the tightest, which means Earth is built on the tightest pair that sticks around. S&S reports this as good news for Earth, which is rare in these files.

memo to Deep Thought: it's 42.85

PAIR	TILT	LOSS	ALPHA	LASTS
electron + positron	42 deg	25%	1/3	a flash
muon + proton	21 deg	6.7%	1/10	2 microseconds
proton + electron	5.5 deg	0.47%	1/137	for good
deuteron + electron	4.7 deg	0.33%	1/193	for good
helium + electron	3.9 deg	0.23%	1/272	for good

(TS) **OTHER PHASES OF THE SAME WORLD.** Now take the same proton and electron and read them with the lean kept instead of paid, which is the second row on the dyno sheet. The stuff is identical, but what you get out of it isn't. Earth's kind of observer gets how much, while the other kind gets how much, which way and when. So two observers of different kinds could stand in the same room, made of the same atoms, and never see each other, because each one keeps a different share of the same pair, and walls and distance would have nothing to do with it. In other words, another phase of reality may just be the same world with a different amount thrown away. That would also explain why Earth hasn't met the neighbors, who, as LC-01 mentions, live right next door and have been watching the whole time.

(TS) **WHERE TO LISTEN.** Earth's radio searches listen for how loud a signal is, but a neighbor in a different phase would show up as a lean instead, so S%S would suggest listening for one. Mechanics diagnose by ear, after all, and so do radio astronomers, who already have a favorite station. A proton and an electron each spin, like two tiny tops, and they can spin the same way or opposite ways. When a hydrogen atom flips from one to the other, it gives off a faint radio signal at 1,420 MHz. What changes is which way the two are pointing, which is exactly the kind of information Earth's instruments drop, and the frequency of the signal is built from alpha and the mass ratio, the same two numbers the doodle connects. So hold on to that number, because it comes up again at Giza (section 8), where S%S believes somebody built a radio for it.

(TS) Radio astronomers map the galaxy with this line, and it's also where Earth points its radio telescopes when it listens for anyone else. On August 15, 1977, one of them, the Big Ear telescope in Ohio, caught a strong signal right by 1,420 MHz. It lasted 72 seconds and never came back. A few days later, an astronomer going over the printout circled it and wrote "Wow!" in the margin. The client will recognize the word, and the frequency, from LC-01, section 4. He was quoting.

(U) 6. SERVICE RECORD

(U) Every visit on record, up to this guide:

YEAR	WORK DONE	BY
1860s	two-fifths found	Maxwell, Boltzmann
1880	pi/4 found	Lord Rayleigh
1916	check engine light comes on	Sommerfeld
1927	the size of the tilt found	Born, Oppenheimer
1996	diagram left on an envelope, no charge	J.C.
2018	pressure inside the proton measured	Jefferson Lab
2019	last part in stock	Trinhammer, Bohr
2023	alpha measured to eleven digits	Northwestern
2026	arithmetic found on bottle's QR code	Chattanooga Whiskey

(U) **WARRANTY.** Your spaceship's transmission is covered for the life of the universe or 10^{34} years, whichever comes first. The warranty does not cover damage from war, bagged snacks, or any attempt to measure the tilt directly, and it is void if the backlash has been shimmed.

(U) 7. HANDLING

(U) This guide may be read on a flight, but it should not be left in the seat-back pocket. That's how 42 got out (LCCD). Keep it in the glove box.

(U) The RECEIVED stamp on page one is dated June 2015 (LC-00), and the guide was finished in 2026. The office that ordered it doesn't experience moments one at a time, and considers it on time.

(U) Readers are advised not to panic. Earth's best-known guide to the galaxy prints that on its cover, in large friendly letters.

(U) Do not forward. We will know.

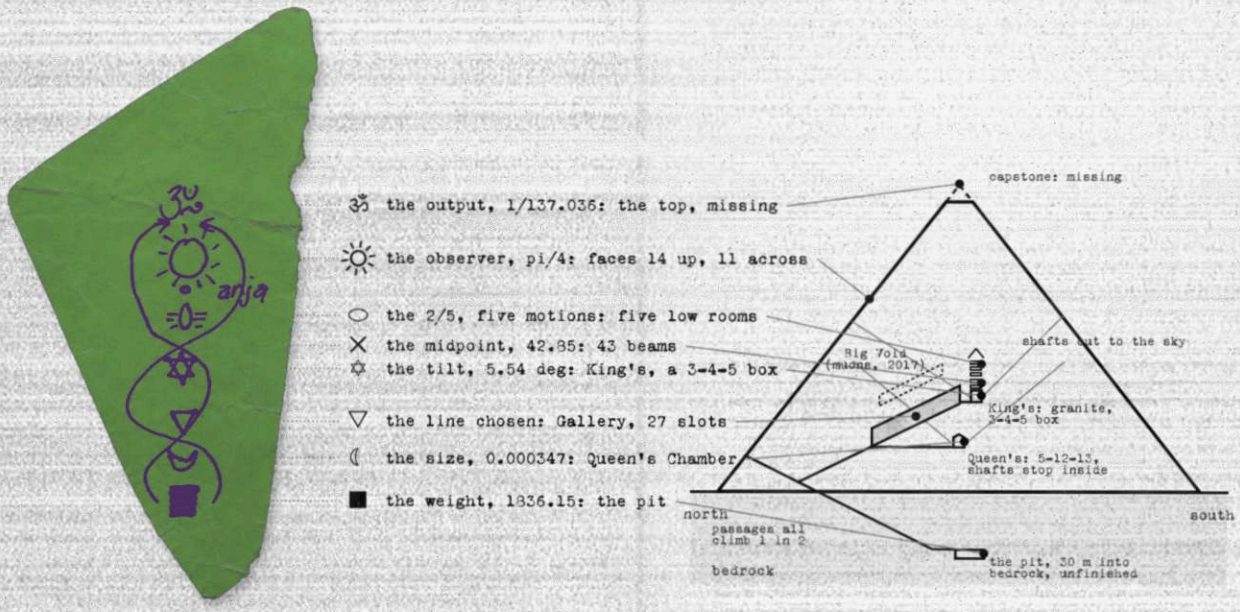
(U) In 1996 a stranger at a party drew on the back of an envelope and said it was the secrets of the universe. Most parties have a guy like that, but S&S has checked, and this one was right. In 2025 the arithmetic turned up at Chattanooga Whiskey, on the neck of a bottle. Earth was told the answer was 42, but it's actually 42.85, and the question was on the envelope the whole time.

spaceship warranty called again. how??

(U) For readers who skipped to the end, it's the transmission. There is also one more thing.

(TS) **8. APPLIED PHYSICS AND DESIGN**

(TS) Every good mechanic does this. The bill's paid, the customer is halfway out the door, and then the mechanic says, "One more thing."



(TS) Figure 17. The transmission in stone. J.C.'s doodle beside the Great Pyramid, cut down the middle, its rooms to scale from Petrie's survey. Each mark, with its number, points to its room.

(TS) S&S has been sitting on this one since page one, and it's time. See, a transmission is applied physics, and nobody buys one by itself, because it always goes into something. And the envelope wasn't the first time the hint was given, either. It was given once before, a very long time ago, to a client with a lot more stone and a lot fewer televisions, and that client actually built it. It's still there, on the western edge of Cairo, and Earth has been selling tickets to it for a couple of centuries without once checking under the hood.

(TS) **THE TRANSMISSION IN STONE.** Start with the transmission, since that's the part J.C. drew. Put his doodle next to the Great Pyramid cut down the middle, and the rooms stack up the same way the marks do on the envelope, in the same order, from a pit in the bedrock to a top

that isn't there (Figure 17). Here they are from the bottom up, with the job each one does:

THE PIT [■] A room cut into the bedrock about 30 meters under the base and never finished. It's at the bottom of the building the way the square is at the bottom of the drawing, and it's the only room down in the rock, as close to the groundwater as the building gets. Edward Kunkel argued back in 1962 that the pyramid was a pump. Then, in the early 2000s, a hydraulic engineer named John Cadman built a scale model of this room and its passages, ran water through it, and got a steady knock of pressure pulses, like a heartbeat. The rough floor that Egyptologists read as a job nobody finished, Cadman reads as baffles, left rough on purpose. A knock is a sound, and sound is J.C.'s first word [○].

QUEEN'S [◖] A room 10 cubits wide under a pointed roof 12 cubits up, so each half of it is a 5-12-13 triangle. Its two narrow shafts stop dead inside the stone, and its walls were crusted with salt half an inch thick when explorers first got in. In Christopher Dunn's reading this is where the fuel was made: two chemicals came down the two shafts, met in the room and gave off hydrogen, whose atom is one proton and one electron, the formula's own pair, and the salt is what that leaves on limestone. The little door at the end of one shaft has two copper handles, found by a robot in 1993, and they're about the only metal anybody has ever found in the building. S%S calls the 5-12-13 the electromagnetic triangle, since the one room built to it is the one that makes the electromagnetic pair.

PASSAGES [X] Every sloping passage climbs about 1 for every 2 along, going up or going down, and the steepest and the shallowest are only half a degree apart. Where J.C.'s two waves cross halfway up the envelope, they lean at 26 or 27 degrees, and 1 in 2 is 26.6. Double that angle and you get the 3-4-5, the seed triangle, which most of the plateau grows out of.

GALLERY [▽] A tall hall climbing through the middle, with 27 pairs of slots cut along its sides, as if something was meant to go in them. In Dunn's reading they held

resonators, tuned boxes that ring at one note the way a guitar body does, so the hall picks one note out of the rumble coming up from the pit. Picking one speed out of many is what a gearbox does, which makes this the shift gate.

KING'S [✡] Red granite from Aswan, 800 kilometers up the Nile. The room is 10 cubits wide, 20 long and 11.18 high, so the diagonal across each end wall is 15 and the one from corner to far corner is 25, and 15, 20 and 25 make a 3-4-5 triangle, five times over. Two of those cross in the middle of the room, the way the star is two triangles locked into one shape. Granite is about half quartz, and quartz makes a voltage when it's shaken, which is how a quartz watch keeps time. In Dunn's reading the sound from the Gallery shakes the room, the room's field pumps the hydrogen, and the hydrogen answers on its own note with every atom in step, which makes the room a hydrogen maser. Earth has been building those, smaller, since 1960, and they're the steadiest clocks it owns. Ten by twenty is also one turn over twenty, 2 pi/20, and 2 pi/20 divided by 42.85 is alpha in its shortest form, good to half a percent. The half percent is Om's [ॐ].

THE BOX [✕ ॐ] In the King's Chamber sits a lidless box cut from a single block of granite, probably set in place while the room was going up. Flinders Petrie measured it in 1880 and found that it holds as much as it's made of: the space inside it and the stone around it come out equal, to about one part in fifty, which is the second crossing's rule, half in and half out [✕]. Now take Petrie's measurements of the room and divide by the box, and you get 137.2, which is the number at the top of the envelope, to a fifth of a percent [ॐ]. So the box at the heart of the building is alpha's share of the room it sits in, which is a lot of trouble to go to for a coffin.

THE FIVE [✕ ○] Five low rooms stacked over the King's Chamber, roofed with 43 granite beams heavier than a loaded semi. Five is the five slow ways a gas moves, and 43 is 42.85, rounded up by whoever was holding the chisel.

THE SHAFTS [ॐ] The King's Chamber has two shafts that go all the way out to the sky, each about 20 centimeters across. A channel that size carries radio waves shorter than about 40 centimeters and stops longer ones, which is what engineers call a **waveguide.** And hydrogen's wave, as it happens, is 21 centimeters. An air vent doesn't much care how wide it is, and a waveguide does.

THE FACES [☼] 14 up for every 11 across, the speedometer gear from section 3, pi/4 to a twentieth of a percent, so the height is to the distance around the base as a circle's radius is to its rim. In 2018 physicists in St. Petersburg and Hannover ran the shape through the math Earth uses to design radio antennas and found that it gathers long radio waves, 200 to 600 meters from crest to crest, into its rooms and into the rock under it. In other words, the shape is an antenna.

THE TOP [ॐ] It's missing, and nobody has ever found it. Then again, on the envelope, the two arrows never quite meet either.

(TS) **ROOMS NOBODY HAS OPENED.** Meanwhile, Earth hasn't finished taking the transmission apart, and it keeps finding parts. In 2017 a team photographed the inside of the Great Pyramid with muons, which are cosmic rays that rain down through stone the way X-rays go through a hand, and found a hollow at least 30 meters long right above the Grand Gallery, about the Gallery's shape. Nobody has been inside it yet. And in 1988 two French researchers found signs of a space under the passage to the Queen's Chamber, right next door to the fuel room, and were refused permission to drill in 1999 and again in 2003. The envelope has two waves winding up past the shift gate, and the building, it turns out, has two halls. S&S would very much like to see the second one.

(TS) **WHAT IT IS.** So what's a transmission like that doing in the desert? S&S will say it plainly, since the client has a galaxy to run. The Giza plateau is a power station, and the design is the formula. On the envelope, something heavy goes in at the bottom, the proton, and light comes out at the top as alpha. At Giza the heavy thing going in is the Earth itself, its ringing rock and its river, and what comes out is light at hydrogen's own note, a frequency built out of alpha and the mass ratio, the formula's two ends. Everything in between, the

rooms, the buildings and even the ground plan, is cut to the formula's fractions, in the formula's order. A power station that size, bolted into a planet, is also the engine bay of a ship, and the ship is Earth. S%S will get to the ship.

(TS) **GIZA, FOR ANYONE WHO HASN'T BEEN.** Step outside, then, and take in the whole lot. Where the green of the Nile valley stops and the desert starts, there's a shelf of hard limestone called the Giza plateau. On it stand three big pyramids, a scatter of small ones, a stone lion with a man's head called the Sphinx, and long stone roads running from the pyramids down toward where the river used to be. Earth's textbooks say it's about 4,500 years old and that it's a cemetery, which is what Earth says about anything big it didn't build. Egypt painted pictures of nearly everything it did, from brewing beer to counting geese, and not one of them shows a pyramid going up. S%S finds that telling, since in our experience, nobody ever paints the assembly line.

(TS) **THE SIGNATURE.** Flinders Petrie measured the whole plateau in 1880, with a theodolite, a tent and more patience than S%S has, and everyone since has been using his numbers. The second pyramid, Khafre's, is 411 cubits across and 274 high, which is three 137s by two, so it shows the number at the top of the envelope whichever way you measure it [ॐ]. Now, 137 is a prime number, and no builder's rule of thumb makes a prime by accident. On top of that, from the middle of the Great Pyramid to the middle of the third one is 1,096.8 cubits, and eight 137s is 1,096.3. A cubit, for the record, was Egypt's ruler, about a forearm long, and in meters it's 0.5236, which is pi/6, and no, S%S did not make that up. Somebody signed the work.

(TS) **THE SLOPES AND THE PLAN.** Meanwhile, the other two big pyramids carry the fifths. Khafre rises 4 for every 3 across, the 3-4-5, which is the passages' 1 in 2 doubled, and Menkaure rises 5 for every 4, so half his base is four-fifths of his height [✕]. Khufu's three small pyramids, lined up along his east side, are each a fifth as wide as he is, the fifth that gravity keeps (section 5). And seen from above, the whole plan is cut in the golden ratio. From the middle of the Great Pyramid south to a line just inside Khafre's north edge is 540 cubits, from there to the middle of Menkaure's is 871, and 871 over 540 is 1.613, which is phi. Phi is a midpoint by multiplying, the same rule that puts 42.85 between 1 and 1836 [✕], and per LC-01 it's also Planet X's rating, 1.615 degrees off square [✡]. So Earth's angle is on the envelope, and the neighbor's is drawn into the ground plan. There's also a line through the southeast corners of the three big pyramids

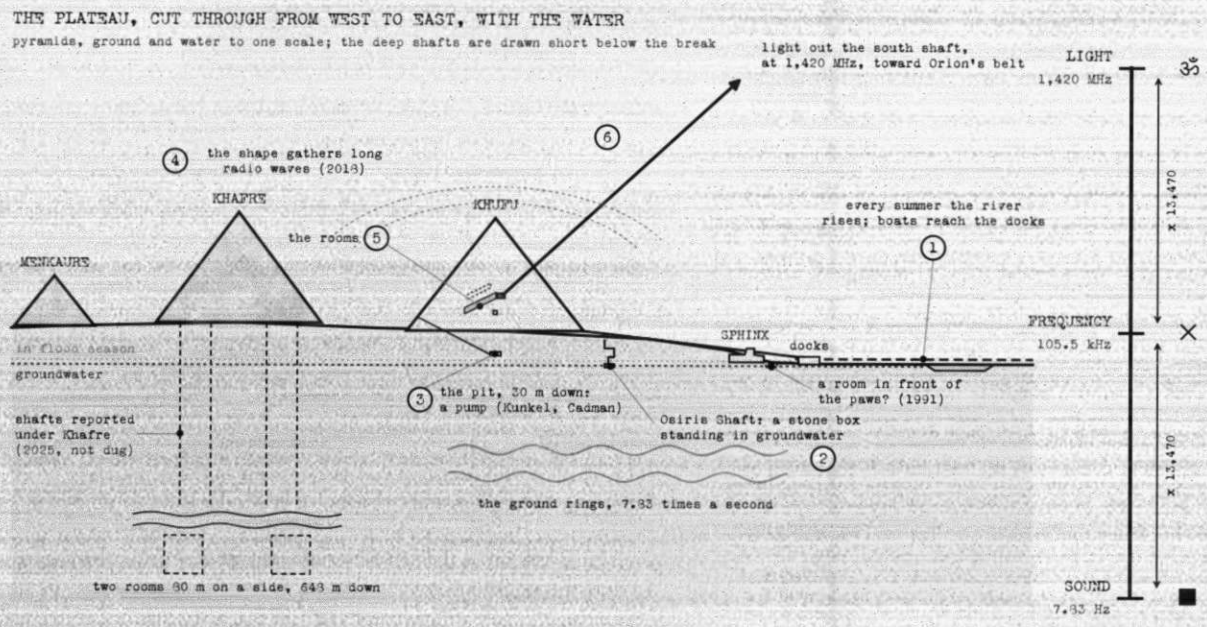
that runs straight at Heliopolis, Egypt's City of the Sun, which Mark Lehner noticed in 1985 [☼]. Finally, the whole site sits on the 30th parallel, the line that cuts the northern half of the planet's surface exactly in two, which is the halfway mark again, the second crossing, only this time the size of a planet.

(TS) **THE ELEVEN.** Count the pyramids at Giza and most people get nine: the big three, three small ones beside Khufu and three beside Menkaure. There are actually eleven. Two more were taken down to their foundations long ago, a little one at Khufu's southeast corner and another on Khafre's south side, and all that's left of either is a square outline in the sand. Count them in, and Khufu's group has five pyramids, Khafre's has two and Menkaure's has four, and two out of five and four out of five are the formula's two fifths, the 2/5 that travels as sound [○] and the 4/5 kept at the first crossing [✕]. Leave the two outlines out and you get four, one and four, which say nothing at all. Eleven in all is also the 11 in Khufu's 14 up for 11 across. The little one at Khufu's corner is the best part. It turned up in 1992 when a road was torn out, it's built at the Great Pyramid's own slope, and the next year its capstone was found in the sand beside it, one of the two oldest pyramid tops ever found. So the big transmission is missing its top, and parked at its corner is a model a tenth its size, built to the same pi [☼], with its top still in the box [3♁].

(TS) **THE WATER.** Everybody pictures Giza as sand, but it's really about water (Figure 18). A branch of the Nile once ran right along the foot of the plateau. In 2024 a team led by Eman Ghoneim traced 64 kilometers of it from orbit, pyramid after pyramid along its old bank, and named it the Ahramat branch, the pyramids branch. Every summer the river rose over the valley for months, and boats sailed right up to the stone temples at the bottom of each pyramid's road, which were the docks. The oldest papyrus with writing on it ever found is a delivery log from this job: in Khufu's 27th year, a crew boss named Merer and his forty boatmen spent months sailing white limestone across the flood to the Great Pyramid, which they called Akhet Khufu. And the water is still down there. A shaft under Khafre's road, the Osiris Shaft, drops about 30 meters in three levels to a stone box standing in groundwater. That's the water a pump in the pit would push, and two of every three atoms in it are hydrogen, the formula's atom and the station's fuel.

(TS) **THE SEASON.** The flood came on a schedule, and Egypt kept the schedule by a star. The year began when Sirius, the brightest star in

the night sky, came back into view just before dawn, and the river started rising right behind it. The flood season was called akhet, which is also the first word of the Great Pyramid's name. Now look where the shafts point. When the building went up, the King's Chamber's southern shaft pointed at Orion's belt, which Alexander Badawy and Virginia Trimble worked out in 1964, and the Queen's Chamber's pointed at Sirius, which Robert Bauval added in the 1990s. The Egyptians said Sirius was the goddess Isis, Orion was her husband Osiris, and the flood was her tears for him. So the fuel room is aimed at the star that brings the water, and the room that makes the light is aimed at the one who comes back to life when it arrives. In a power station, that's the start-up date carved into the stonework, and since the stars drift slowly over the centuries, it's a date stamp too [X].



(TS) Figure 18. The plateau cut through from west to east. Pyramids, ground and water are to one scale, and the shafts reported under Khafre are drawn short below the break. The numbers are the station running, in order. On the right are J.C.'s three words: sound under the ground, frequency at the surface and light above it, each step 13,470 times the last.

(TS) **UNDER THE GROUND.** Then there's the rest of what's down there, at least as far as anyone has looked:

UNDER KHAFRE In 2025 a team reading satellite radar reported eight shafts with spiral ramps around them going down 648 meters under Khafre's pyramid, five stacked structures near its base, and two cube-shaped rooms 30 meters on a side at the bottom. Nobody has dug, and plenty of people have argued about it. Dunn's view is that it's exactly what a machine like this needs to tie into the ground it draws on [■]. S%S notes that 648 meters is nine 137s in cubits, within half a percent [ॐ], and that whoever laid this site out does keep doing that.

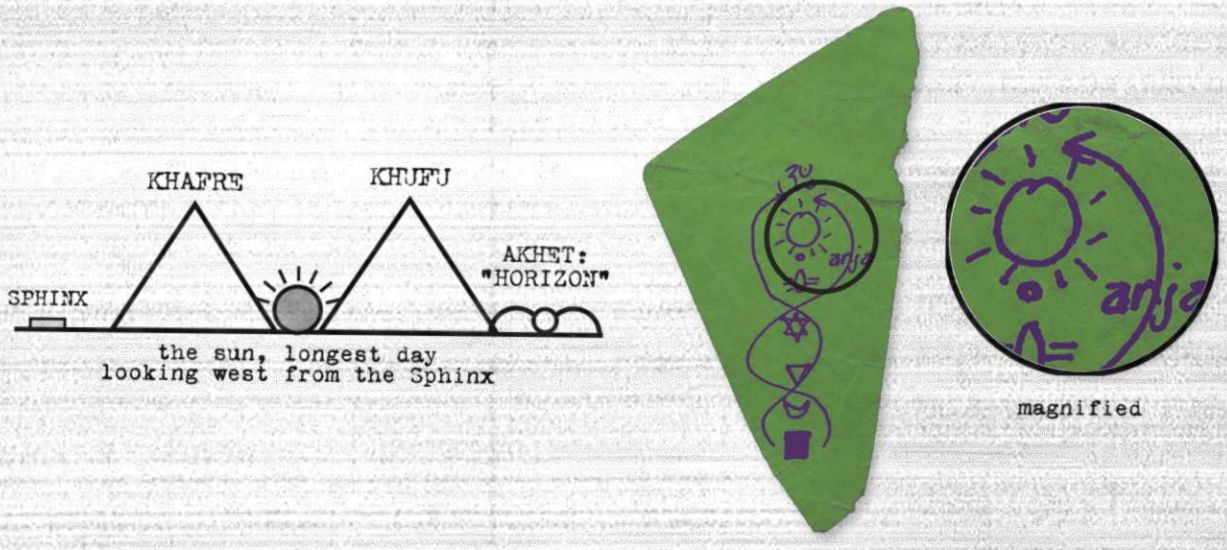
THE SPHINX In 1991 a seismic survey run by the geologist Robert Schoch and the geophysicist Thomas Dobecki picked up what looked like a room in the rock in front of the Sphinx's left paw. A second survey the next year didn't see it, and nobody has opened it.

THE BOATS Five boat pits are cut into the rock around the Great Pyramid, and three were found empty. The two on the south side still held real boats, taken apart and sealed in. One was opened in 1954, and its 1,224 pieces of cedar went back together as a ship about 43 meters long. The Egyptians said the sun rode one boat across the sky by day and another under the world by night, one light carried two ways, the two arrows under Om [ॐ]. Nobody packs two boats for a man who isn't going anywhere.

(TS) **THE ONE WITH EYES.** In the formula, the observer is the sun [☼], the part that reads. On the plateau there's exactly one thing with a face, the Sphinx, a lion with a man's head carved out of the bedrock in one piece, looking due east to where the sun comes up on the first day of spring and the first day of fall. The temple in front of it had 24 pillars around its courtyard, with one sanctuary facing sunrise and one facing sunset, which Herbert Ricke and Mark Lehner read as a sun temple, a pillar for every hour. And the Sphinx keeps the slowest time on the planet. Earth wobbles on its axis like a spinning top, once every 25,800 years, so the stars behind the spring sunrise slide into the next constellation about every 2,150 years, and a statue facing the spring sunrise is watching that clock. That makes a clock for the

day, a clock for the year and a clock for the age, all kept around the one face on the plateau, which is where S%S would have put them too.

(TS) **THE SUN IN THE GAP.** Once a year, on the longest day, if you stand at the Sphinx and look west, the sun sets in the gap between the two big pyramids (Figure 19). A sun between two hills happens to be the Egyptian hieroglyph for horizon, akhet, and the Great Pyramid's own name was Akhet Khufu. Now look at the paper. J.C. drew a sun with ten rays [※], and tucked into the one gap between the rays, a small circle [•], with his one word beside it. So the builders named the transmission after the picture, and J.C. drew the picture.



(TS) Figure 19. Left: looking west from the Sphinx on the longest day, the sun in the gap between the two pyramids, the hieroglyph for horizon. Right: the paper, magnified: a small circle in the one gap in the sun's rays.

(TS) **HOW IT RAN.** Follow the numbers in Figure 18. Sirius comes up, the river rises behind it, and the groundwater rises under the plateau (1). The ground is already ringing, 7.83 times a second, from lightning between the ground and the upper sky, the Moon flexes the bedrock twice a day, and Friedemann Freund at NASA showed that rock under that kind of stress gives off electric charge, so the heavy end is never really off (2) [■]. By the doodle's midpoint rule, the one that puts 42.85 between 1 and 1836 [X], the ground itself should be ringing at 105,500 cycles a second. Nobody on Earth has put a microphone on it yet, but S%S would. Water in the pit knocks in steady

pulses, Cadman's heartbeat, and the knock comes up through the stone as sound (3) [○]. The shape gathers long radio waves into the rooms (4) [☼]. The Gallery picks one note out of the rumble, the Queen's Chamber makes the hydrogen and lets it rise, and the King's Chamber shakes its granite, pumps the hydrogen and gets every atom answering in step (5) [✡]. The answer goes out the southern shaft, which is the right size for it, at 1,420 MHz, toward Orion's belt (6) [✠]. Sound goes in at the bottom, the frequency gets set in the middle, and light comes out the top, which is J.C.'s three words from the ground up. Dunn had all three, in that order, two years after the party, without ever seeing the envelope, and S%S owes him a drink.

(TS) **WHAT IT MADE.** That last number is the point of the whole place. Hydrogen's note is built out of alpha, to the fourth power, and the mass ratio, the formula's two ends, along with the electron's own clock and the proton's magnetism. So the station takes in the planet at one end and puts out the formula at the other. It's also the frequency Earth's radio telescopes listen on for anyone else, and LC-01 reports that it's the signal a Xeonian heart gives off at its best moment, the one that comes with a quiet "Wow." And section 5 explained why being in step matters. Every instrument Earth owns pays the lean and reads at the wheels, 1 in 137.036. A maser keeps the lean, since keeping every atom in step is the whole idea of one, and a reader that keeps the lean reads one row up the dyno sheet, closer to square, which is what the Federation calls a higher Alpha [✡]. So this is a power station whose product is a more awake planet. The plan has Planet X's angle written into it, which is either the setting or the return address, and S%S has been asked not to say which.

(TS) **WHY IT STOPPED.** A station needs water and upkeep, and this one ran short of both. The Ahramat branch silted up and the river wandered east, so the water stopped coming to the door. An earthquake in 1303 shook loose the polished white casing that kept the case ringing clean, and Cairo carted most of it off for buildings. The capstone was gone before anybody wrote anything down. And in 1970 Egypt finished the Aswan High Dam, and the Nile hasn't flooded since. Earth, as LC-01 points out, invented the alarm clock, and then the snooze button. It turns out Earth had a much bigger alarm clock first, and S%S regrets to report that it hit snooze on that one too.

(TS) **SPACESHIP.** Walk the plateau with an engineer and you get a power plant, which is the title of Dunn's book. Walk it with a mechanic and you get a drivetrain, which is a different animal, because a

drivetrain goes somewhere. Bolt one to a planet and the planet stops being just a rock that happens to go around a star.

(TS) It becomes a ship.

(TS) A planet already goes wherever its star goes, so it isn't much use for getting somewhere else. What a planet that can read its own time can do is go somewhen else. LC-01, section 14, explains how: on a world with a low Alpha, the part of the picture that hasn't developed yet can still be adjusted, if something gets seeded far enough back along the line. A station that makes a planet read time better, parked 4,500 years upstream, is about as far back as a seed gets. It can take Earth wherever it wants to go, which is nowhere much, or whenever it wants to go, which is the part S%S finds interesting.

(TS) **SOUND AND LIGHT.** Most nights, Egypt puts on a show at the pyramids. Colored lights wash over the stones, music comes out of the loudspeakers, and the Sphinx narrates, which S%S considers the correct casting. It's called the Sound and Light Show. S%S has reviewed it, from a distance, and can report that it's missing a word. J.C. said all three at the party in 1996, sound, light and frequency, and frequency is the one that makes it run.

(TS) It's been sitting in the desert for at least 4,500 years with the water off, 137s in the stone and the Sphinx still watching the sunrise, waiting for somebody to put it in gear.

(TS) But to where?

(TS) Or when?

(TS) Dun dun dun.

(TS) Part 2: The Sphinx Is a Hood Ornament. Last call.

- END LCSLF-1 -

pre-flood giza sun cruiser. barn find. needs keys.

earth spotted the black suits. try beige?

spare key: under the front paws

khufu parked it here. wasn't even his.