

## MY WEIRD PROMPTS

Podcast Transcript

EPISODE #198

# Why the World Runs on Zulu: The Secrets of Universal Time

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## EPISODE SYNOPSIS

Have you ever noticed a timestamp ending in "Z" and wondered what it meant? In this episode, Herman and Corn explore the invisible foundation of Coordinated Universal Time (UTC). They break down the linguistic compromises, the difference between atomic and astronomical time, and why this single heartbeat is critical for global aviation, weather forecasting, and modern computing.

## DANIEL'S PROMPT

### Daniel

I am a big fan of Zulu time, or Universal Coordinated Time (UTC). If you know Zulu time and the current offset, you can tell the time anywhere on the planet. It's commonly used in aviation, meteorology, and computer logs, but there are often points of confusion regarding daylight savings time and the difference between GMT and UTC. How did Zulu time come about, who uses it, and are there many people who use it personally to benchmark the time across different time zones?

# TRANSCRIPT

## Corn

It is a rainy afternoon here in Jerusalem, and I was just looking out the window thinking about how the weather does not really care what time our clocks say. It just does its thing. But for us humans, keeping track of when that rain is going to hit is a massive exercise in coordination. Welcome back to My Weird Prompts. I am Corn, and I am sitting here with my brother, who I suspect has at least three different time zones memorized at any given moment.

## Herman

Herman Poppleberry here, and you are absolutely right, Corn. I actually have a world clock widget on my desktop that shows four different zones, but the one at the very top, the one that never changes, is UTC. Our housemate Daniel sent us a great prompt today about this exact thing. He was looking at a rain forecast earlier and noticed it was denominated in Zulu time, or Coordinated Universal Time. He wants to know where it came from, why we use it, and if it is actually different from Greenwich Mean Time.

## Corn

It is a classic Daniel question. He has that eye for the systems running in the background of our lives. And Zulu time is definitely one of those invisible foundations. It is funny because we usually think of time as something local. It is noon because the sun is overhead. But in a connected world, local time is almost a liability in some industries.

## Herman

Exactly. If you are a pilot flying from Tokyo to Los Angeles, you are crossing the International Date Line and multiple time zones. If you tried to coordinate your flight plan using local times, the math would be a nightmare. You would be constantly adding and subtracting hours just to figure out when you are supposed to land. Zulu time provides that single, unwavering heartbeat that the whole world can sync to.

## Corn

So let us start with the name. Why Zulu? It sounds a bit mysterious or maybe like a military code.

### Herman

It is a military code, in a way. It comes from the nautical and military tradition of dividing the world into twenty-four primary time zones, each roughly fifteen degrees of longitude wide. Each zone was assigned a letter of the alphabet, skipping J. The zone centered on the prime meridian, which runs through Greenwich, England, is the zero-offset zone and is designated by the letter Z. In the phonetic alphabet used by the military and aviation, the letter Z is spoken as Zulu. So Z-time—zero-offset time—became Zulu Time. When you see a timestamp ending in a capital Z, like fourteen hundred Z, that is the world telling you to look at the master clock.

### Corn

That makes sense. It is a lot punchier than saying Coordinated Universal Time every time you want to check a log. But that brings up the acronym itself. Why is it UTC? If it is Coordinated Universal Time, should it not be CUT? Or if it is the French version, Temps Universel Coordonné, should it not be TUC?

### Herman

You have hit on a classic bit of international compromise, Corn. Back when they were standardizing this, the English speakers wanted CUT and the French speakers wanted TUC. To avoid favoring one language over the other, international bodies like the International Telecommunication Union and the International Astronomical Union settled on UTC. It is technically not an acronym for anything in any language, but it fits the pattern of other related time scales like UT0 and UT1.

### Corn

I love that. Even our global time standard is the result of a linguistic standoff. Now, Daniel mentioned a common point of confusion, which is the difference between UTC and Greenwich Mean Time, or GMT. Most people use them interchangeably, but Daniel suspects there is some pedantry involved in the distinction. Is he right?

### Herman

He is absolutely right. For most casual conversations, they are the same thing. They both represent the time at the prime meridian. But scientifically and technically, they are very different. GMT is a time zone. It is a historical standard based on the rotation of the Earth. Astronomers used to measure it by when the sun crossed the meridian at the Royal Observatory in Greenwich.

## Corn

But the Earth's rotation is not perfectly consistent, right? It wobbles and slows down.

## Herman

Precisely. The Earth is a bit of a messy clock. It is affected by tides, the movement of the Earth's core, and even large earthquakes. So, GMT is an astronomical time. UTC, on the other hand, is an atomic time scale. It is derived from an ensemble of several hundred atomic clocks around the world. These clocks measure the vibrations of cesium atoms, which are incredibly stable, and their readings are combined by the International Bureau of Weights and Measures to form International Atomic Time and then UTC.

## Corn

So UTC is the high-precision version. It is like the digital master clock, while GMT is more of a traditional, sun-based reference.

## Herman

Right. And because the Earth's rotation is slowing down, UTC actually has to be adjusted occasionally to stay in sync with Earth's day. That is where leap seconds come in. We add a second to UTC every now and then so that when the sun is directly over Greenwich, UTC still says it is twelve noon to within about a second. Though, interestingly, in twenty twenty-two the General Conference on Weights and Measures voted to phase out leap seconds in UTC by around twenty thirty-five, because they cause too many headaches for computer systems. The plan is to let the difference between atomic time and the Earth's rotation grow a bit larger before we ever bother adjusting it again.

## Corn

We actually touched on some of the complexities of global standards back in episode two hundred sixty-four when we talked about mainframes. Those old systems are often the ones most sensitive to these tiny shifts in timekeeping. But let us get into who actually uses Zulu time today. Daniel mentioned aviation and meteorology. Why is it so critical for them?

### Herman

In meteorology, it is about the when of the data. If you have weather stations all over the globe taking measurements, you need them to take those measurements at the exact same moment. If a station in New York takes a pressure reading at eight in the morning local time, and a station in London takes one at eight in the morning local time, those readings are five hours apart. You cannot build an accurate global weather model with staggered data. So, every major weather observation in the world is recorded in UTC.

### Corn

That is why Daniel saw it on the rain forecast. The model was likely generated using data points all synced to that Zulu clock. And I imagine it is the same for aviation. If two planes are approaching the same airspace, there cannot be any ambiguity about what time they will be there.

### Herman

Exactly. Air traffic control is a giant, high-stakes game of synchronization. Every flight plan and weather briefing uses Zulu time. If you look at a METAR report—that is the standard coded weather report for pilots—the timestamp is always in Zulu. For example, if you see zero eight seventeen thirty Z, that means the observation was taken on the eighth day of the month at seventeen thirty Zulu. It eliminates the "wait, is that your time or my time" conversation, which is the last thing you want to be having when you are traveling at five hundred miles per hour.

### Corn

It is also huge in computing. If you have ever looked at server logs, they are almost always in UTC. If you are trying to debug a system where a user in Sydney is interacting with a server in Virginia, and you are looking at the logs from a headquarters in London, trying to piece together the sequence of events using three different local times would be a nightmare.

### Herman

Oh, it is more than a nightmare, it is a recipe for data corruption. Most modern databases store all their timestamps in UTC and then only convert to local time when they are displaying that data to a human. This is especially important for things like financial transactions. If you are trading stocks globally, the sequence of who bought what and when has to be absolute. You cannot have a situation where a trade appears to happen before the order was placed because of a time zone offset.

## Corn

And then there is the giant headache that Daniel mentioned: Daylight Savings Time. This is where local time really falls apart for technical work.

## Herman

Don't even get me started on Daylight Savings. It is the bane of every programmer's existence. In the United States, for example, we spring forward and fall back. That means one day a year has twenty-three hours, and another day has twenty-five hours. If you are running a scheduled task that is supposed to happen at two-thirty in the morning, what happens when two-thirty in the morning literally does not exist because the clock jumped from two to three?

## Corn

Or worse, what happens when two-thirty happens twice because the clock fell back from three to two? You might end up charging a customer twice or sending out duplicate notifications.

## Herman

Exactly. UTC does not have Daylight Savings. It does not care about politics or farming schedules or trying to get more sunlight in the evening. It is perfectly linear in its design: one second follows another, sixty seconds in a minute, sixty minutes in an hour, twenty-four hours in a civil day as UTC is defined. Using UTC as your benchmark means you never have to worry about the missing hour or the extra hour.

## Corn

It is a bit like a mathematical constant for time. It is the anchor. But what about the history? How did we get to a point where the whole world agreed on a single zero-point in Greenwich? It was not always that way.

## Herman

Not at all. Before the mid-nineteenth century, time was purely local. Every town had its own noon based on the sun. If you traveled twenty miles west, your clock would be a few minutes off from the town you just left. This worked fine when people moved at the speed of a horse, but then the railways came along.

### Corn

Right, the Railway Time problem. If you are trying to publish a train schedule, you cannot have every station on the line using a different local time. You would never know when the train was actually arriving.

### Herman

Precisely. The British railways were among the first to standardize, and they chose Greenwich time because that is what the Royal Observatory used for navigation. Then, in eighteen eighty-four, there was the International Meridian Conference in Washington, Dee See. Twenty-five nations gathered to decide on a single prime meridian for the whole world.

### Corn

Was Greenwich the obvious choice?

### Herman

It was the most popular choice because about seventy percent of the world's shipping already used charts based on Greenwich. But it was not unanimous. France, for example, abstained from the vote. They wanted a neutral meridian, maybe something in the Atlantic or even a meridian through Paris. It took decades for everyone to fully get on board. Much later, in the mid-twentieth century, as atomic clocks became practical, international organizations defined new atomic time scales—first International Atomic Time, then Coordinated Universal Time—using Greenwich as the longitudinal reference but basing the seconds on atomic physics instead of Earth's rotation.

### Corn

It is fascinating how much of our modern world is built on these nineteenth-century decisions, and how later atomic-time decisions layered on top. We are still using the Greenwich meridian as our zero-point in twenty twenty-six, even though the technology we use to measure time has moved from mechanical clocks to vibrating atoms.

### Herman

It really is. And to Daniel's point about people using it personally, I think it is becoming more common. If you work in a global company, or if you are a digital nomad, or even just a gamer who plays with people all over the world, you start to develop a UTC sense. You stop thinking "what time is it in San Francisco" and start thinking "what is the offset from UTC?"

### Corn

I have noticed that too. It is like a mental map. I know that here in Jerusalem, we are usually UTC plus two, or UTC plus three during the summer. If I have a meeting with someone in New York, I know they are UTC minus five, or minus four when they are on summer time. If I just keep the UTC time in my head, the math becomes much simpler.

### Herman

It also helps with that feeling of time zone jet lag you get when you are working remotely. If you are always checking your local clock, you are constantly reminded of how late or early it is for you. But if you look at a Zulu clock, it feels more objective. It is just the time of the world.

### Corn

I wonder if we will ever reach a point where we just get rid of local time zones entirely. There have been proposals for a universal time where everyone on Earth uses the same clock. So, if it is twelve noon in London, it is twelve noon in Tokyo and twelve noon in New York.

### Herman

That would be a massive cultural shift. Can you imagine the confusion? In New York, you would be going to work at maybe thirteen hundred and eating dinner at one or two in the morning. People are very attached to the idea that twelve means the sun is high.

### Corn

True, but we already do that with other things. We do not have local units for weight or distance anymore, for the most part. We have standardized on the metric system in most of the world. Time is the last holdout of localized measurement.

### Herman

It is a holdout because it is tied to our biological rhythms. Our circadian clocks are set by the sun. But as we move more of our lives into digital spaces, that sun-based rhythm becomes less relevant. In a virtual office, the sun does not matter. The only thing that matters is that we all show up at the same moment.

### Corn

That is a great point. The moment is universal, even if the hour is local. Zulu time is essentially the clock of the internet. It is the time of the machines.

### Herman

And it is also the time of space. If you look at the International Space Station, they use UTC. When you are orbiting the Earth every ninety minutes, you see sixteen sunrises and sunsets a day. Local time has no meaning up there. So, they sync to the heartbeat of the home planet, which is UTC.

### Corn

That is a perfect analogy. It is the heartbeat. Now, Daniel asked about points of confusion. We have talked about GMT versus UTC and the Daylight Savings mess. Are there any other traps people fall into when they start using Zulu time?

### Herman

One big one is the date change. Because UTC does not care about your local midnight, the date can change for the world while it is still yesterday for you. If you are in Los Angeles and it is eight in the evening on a Monday, it is already four in the morning on Tuesday in Zulu time. If you are looking at a computer log or a flight schedule, you have to be very careful that you are looking at the right day.

### Corn

I have made that mistake before. You see a Tuesday timestamp and you think you have missed a deadline, but then you realize it is just the Zulu clock getting ahead of your local sunset.

### Herman

Another one is the offset itself. People often forget if they should add or subtract. A simple trick is to remember that the sun moves east to west. So, if you are east of Greenwich, like we are in Jerusalem, you are ahead of UTC. You add hours. If you are west of Greenwich, like in New York, you are behind UTC. You subtract hours.

### Corn

It sounds simple when you say it, but in the heat of a project, I can see how it gets muddled. Especially when you throw in the fact that different countries change their Daylight Savings on different dates. The offset between London and New York is not even constant throughout the year!

### Herman

Exactly! There is a two or three-week window every year where the United States has shifted but the United Kingdom has not, or vice versa. During that time, the difference is four hours instead of five. If you rely on UTC, you see that shift clearly. If you just rely on "what is the time in London," you can get caught out.

### Corn

So, for someone like Daniel, or any of our listeners who want to start using Zulu time as their personal benchmark, what is the best way to get started?

### Herman

I would say the first step is to add a UTC clock to your phone or your computer desktop. Most operating systems let you have multiple clocks. Put it right there next to your local time. Do not try to do the math in your head at first, just look at it.

### Corn

And maybe start using it for things that are not strictly local. If you are setting a reminder for a meeting with someone in another zone, write it down in UTC. Meeting at fourteen hundred Zulu. It forces your brain to treat it as the real time and the local time as just a translation.

### Herman

I actually use a twenty-four hour clock for everything now, which helps a lot. Zulu time is always twenty-four hours. There is no AM or PM in the world of aviation or computing. It is just zero to twenty-three fifty-nine. Once you get used to twenty-four hour time, the Zulu transition is much easier.

### Corn

It is also worth looking into Unix Time if you are a real nerd like Herman here. We talked about this briefly in episode one hundred eighty-eight when we were discussing Big Tech's approach to AI. Unix time is basically the number of seconds that have passed since January first, nineteen seventy, counted in UTC.

### Herman

Oh, Unix time is beautiful. It is just one big, ever-increasing integer counting seconds since that epoch. By design, each Unix day is treated as exactly eighty-six thousand four hundred seconds, so it ignores leap seconds. No months, no named days in the core representation—just seconds. It is one of the cleanest ways computers use to represent the passage of time, and then we map that to human calendars with all the messy stuff like leap years and months with thirty-one days.

### Corn

Though it does have its own Wye-two-Kay style problem coming up, does it not? The year twenty thirty-eight problem? We are only about twelve years away from that now.

### Herman

Yes, for older thirty-two bit systems where the time counter is stored as a signed thirty-two-bit integer, the number of seconds will eventually get too big to store, and the clock will overflow in January twenty thirty-eight and wrap around to a date in December nineteen-oh-one. But most modern systems are sixty-four bit now, which means they won't have a similar overflow problem for roughly two hundred ninety billion years. I think we will be okay.

## Corn

Two hundred ninety billion years. I think I can clear my schedule for that. But bringing it back to the present, or at least to January twenty twenty-six, it is clear that Zulu time is more than just a convenience for pilots. It is a way of thinking about our place in a globalized world.

## Herman

It really is. It is about recognizing that while our daily lives are local, our impact and our connections are global. When I see that Zulu clock, I am reminded that somewhere in the world, someone is just starting their day, someone is right in the middle of a shift, and someone is winding down, all at this exact same moment.

## Corn

It is a unifying force. It is one of the few things the entire planet has actually agreed on. We might disagree on politics, religion, and even which side of the road to drive on, but we all agree on what time it is at the prime meridian.

## Herman

Well, mostly. There are still a few quirks. Did you know that some countries have time zones that are offset by thirty or even forty-five minutes? India is UTC plus five-thirty. Nepal is UTC plus five-forty-five.

## Corn

Forty-five minutes? That seems intentionally difficult.

## Herman

It is actually a point of national identity. Nepal chose that offset in nineteen eighty-six to align with a meridian near the center of the country and to distinguish itself from India's time zone. But it also conveniently differentiates them from India's time zone. Even so, they still use UTC as their base. They just add five hours and forty-five minutes to it.

### Corn

It is the anchor that holds the whole messy system together. I think the practical takeaway here is that even if you are not a pilot or a meteorologist, understanding UTC gives you a better operating system for the modern world. It removes the ambiguity.

### Herman

Definitely. And it is just cool. There is something very satisfying about knowing the true time. When Daniel looks at his rain forecast and sees twelve hundred Zulu, he is seeing the same number that a pilot over the Atlantic is seeing and a scientist in Antarctica is seeing.

### Corn

It makes the world feel a little smaller, in a good way. So, to wrap up Daniel's prompt: Zulu time grew out of the need to standardize time for global coordination, especially in navigation, railways, and later telecommunications and computing; it is maintained by the incredible precision of atomic clocks; and while it is technically different from GMT, they serve the same purpose for most of us. And yes, there are plenty of time nerds out there who use it to keep their lives in sync.

### Herman

If you are one of those people who has a UTC clock on your desk, or if this episode made you want to add one, we would love to hear about it. Or if you have another deep-dive question about the systems that run our world, send it our way.

### Corn

You can find us on Spotify and at our website, myweirdprompts dot com. We are closing in on episode three hundred, which is a pretty wild milestone.

### Herman

It really is. We have come a long way since those early discussions about emergent behaviors and global standards. And hey, if you have been listening for a while and you are enjoying the show, it would mean a lot to us if you could leave a quick review on your podcast app. It genuinely helps other curious people find us.

**Corn**

A huge thanks to Daniel for the prompt today. It is always fun to pull back the curtain on something we take for granted, like the time on our clocks. I think I am going to go set a UTC clock on my phone right now.

**Herman**

Welcome to the club, Corn. You will be thinking in twenty-four hour Zulu time before the week is out.

**Corn**

We will see about that. Thanks for listening to My Weird Prompts. I am Corn.

**Herman**

And I am Herman Poppleberry.

**Corn**

We will talk to you next time.

**Herman**

Until then, stay curious.

**Corn**

So, Herman, if it is currently sixteen hundred Zulu, and I want to have dinner at seven PM local time... wait, do not tell me. Let me do the math.

**Herman**

I will give you a hint. We are in winter time here in Jerusalem, so we are UTC plus two.

**Corn**

Okay, so sixteen hundred plus two is eighteen hundred. That is six PM. So dinner is in exactly one hour?

**Herman**

Spot on. See? You are already a pro.

**Corn**

I am not sure if pro is the word, but I am definitely hungry. Let us go see what is in the kitchen.

**Herman**

I think it is Daniel's turn to cook. I hope he has synchronized his kitchen timer to Zulu time.

**Corn**

As long as the food is ready at nineteen hundred local, I do not care what the timer says.

**Herman**

Fair enough. Bye everyone!

**Corn**

Bye!

**Herman**

Wait, one last thing. Did you know that the word second comes from the fact that it is the second division of an hour? The first division being the minute?

**Corn**

I did not know that. But I am not surprised you did.

**Herman**

I have a million of these, Corn. A million.

**Corn**

I believe it. Alright, let us get that dinner.

**Herman**

Onward to the kitchen!

**Corn**

Seriously though, the forty-five minute offset in Nepal is fascinating. I wonder if they have special watches for that.

**Herman**

They actually do! Some mechanical watches have a second crown just for adjusting those fractional time zones. It is a whole sub-genre of horology.

**Corn**

Of course it is. We will have to save that for another episode.

**Herman**

Episode three hundred and five: The Horology of the Himalayas.

**Corn**

Do not tempt me.

**Herman**

It is a good title! You have to admit it is a good title.

**Corn**

It is a great title. Now, move. I am starving.

**Herman**

Synchronizing hunger levels... now.

**Corn**

You are ridiculous.

**Herman**

Guilty as charged. Let us go.

**Corn**

This has been My Weird Prompts. Thanks for sticking with us through the credits.

**Herman**

We really appreciate it. See you next week!

**Corn**

Bye!

**Herman**

Bye!

**Corn**

Seriously, Herman, forty-five minutes?

**Herman**

It is true! Look it up!

**Corn**

I will. Right after dinner.

**Herman**

Deal.