

Coordinated Lunar Time (LTC)

April 10, 2024 • vajiramandravi.com



About Coordinated Lunar Time (LTC)

- It will provide a **time-keeping benchmark** for lunar spacecraft and **satellites** that require extreme precision for their missions.
- It will also **synchronise** the communication between satellites, astronauts, bases and the Earth.
- A unified time standard would be essential for coordinating operations, ensuring the reliability of transactions and managing the logistics of lunar commerce.
- **Why there is need of LTC?**
 - As there is less gravity on the Moon, time **ticks slightly faster** there relative to the time on the Earth.
 - In other words, for someone on the Moon, an Earth-based clock will appear to lose on average 58.7 microseconds per Earth day with “additional periodic variations.
 - It can **create problems** for situations such as a spacecraft seeking to dock on the Moon, **data transferring** at a specific time, **communication, and navigation**.

How does Earth’s time standard work?

- Most of the clocks and time zones of the world are based on **Coordinated Universal Time (UTC)** which is essentially an internationally agreed upon standard for world time.

- It is set by the **International Bureau of Weights and Measures** in Paris, France.
 - It is tracked by a weighted average of more than 400 atomic clocks placed in different parts of the globe.
 - **Atomic clocks** measure time in terms of the **resonant frequencies** — the natural frequency of an object where it tends to vibrate at a higher amplitude — of atoms such as **cesium-133**.
 - In atomic time, a second is defined as the period in which a caesium atom vibrates 9,192,631,770 times. As the vibration rates at which atoms absorb energy are highly stable and ultra-accurate, atomic clocks make for an excellent device for gauging the passage of time.
 - To obtain their local time, countries need to subtract or add a certain number of hours from UTC depending on how many time zones they are away **from 0 degree longitude meridian**, also known as the Greenwich meridian.
 - If a country lies on the **west of the Greenwich meridian**, it has to **subtract** from the UTC, and if a country is located on the **east of the meridian**, it has **to add**.
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Q: What Is Greenwich meridian?

It is an imaginary line, last established in 1851, that was used to indicate 0° longitude. It passes through Greenwich, a borough of London, and terminates at the North and South poles. Because it indicated 0° longitude, it was also known as the prime meridian.

Source: [How and why US wants to establish a time standard for the Moon](#)

Source: <https://vajiramandravi.com/current-affairs/coordinated-lunar-time-ltc/>

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