

Re: questions about UTC time, definitions, leap seconds, and

Source: <http://sci.tech-archive.net/Archive/sci.physics.research/2005-05/msg00557.html>

- *From:* robert bristow-johnson <rbj@xxxxxxxxxxxxxxxxxxxxxxxx>
 - *Date:* Mon, 30 May 2005 05:19:35 +0000 (UTC)
-

in article d7948r\$eea\$1@xxxxxxxxxx, Phillip Helbig---remove CLOTHES to reply at helbig@xxxxxxxxxxxxxxxxxxxxxxxx wrote on 05/28/2005 14:44:

> In article <BEBD4018.7B49%rbj@xxxxxxxxxxxxxxxxxxxxxxxx>, robert
> bristow-johnson <rbj@xxxxxxxxxxxxxxxxxxxxxxxx> writes:
>
>> by 1983, they must have expected about 1 leap second each mean year (1 part
>> per 31556952) why didn't they define the second to be that much longer (say
>> 9,192,632,060 cycles instead of 9,192,631,770 cycles of this cesium
>> radiation? they would still have to add or subtract leap seconds
>> occasionally, but much less often than they did in the late 20th century.
>> why not, when you're *defining* the standard of time (with a much better
>> standard), make that initial definition agree as much as possible with the
>> known astronomical unit, and then stick to it?
>
> Backwards compatibility. For a time, the second was defined as a
> certain fraction of the year 1900; the atomic-time definition probably
> was set up to be as close as possible to this.

i thought of that, too, and that is likely the case. but the ideal time to make small adjustments to the size of the unit is when it's being redefined. also, i see i was wrong about the second. it was the meter that was last redefined in 1983. the second was last redefined (from astronomical time to "cesium time") in 1967 before they were dealing with the leap seconds.

Steve Allen from UCO/Lick Observatory kindly sent me some links, the most salient to my question was <http://www.ucolick.org/~sla/leapsecs/dutc.html> . if you look at the third graphic that displays Length of Day (LOD) minus 86400 SI seconds for the years 1950 to 2005, it apparently shows that currently the solar day is getting *shorter*! the trend has been going down since 1995. (they say that the rotation of the crust has been accelerating for the last 30 years "apparently due to changes of fluid circulation in the outer core of the earth.") that would explain why there were positive leap seconds before and none now (which was my biggest conundrum since the rotation of the Earth *has* to be slowing down, not speeding up). it's almost serendipitous, that the SI unit for the second is almost spot on (for 1/86400 solar day) for the current decade. perhaps in the next decade they will have to add leap seconds again because, of course, the angular momentum

Re: questions about UTC time, definitions, leap seconds, and

of the earth as a whole cannot be increasing in time.

so most of my curiosity has been satisfied. thanks for taking a look at this.

r b-j rbj@xxxxxxxxxxxxxxxxxxxxxx

"Imagination is more important than knowledge."

.

• **References:**

- ◆ **questions about UTC time, definitions, leap seconds, and measurement.**
◇ From: robert bristow-johnson
- ◆ **Re: questions about UTC time, definitions, leap seconds, and measurement.**
◇ From: Phillip Helbig—remove CLOTHES to reply

- Prev by Date: **Re: A question of discrete space-time.**
- Next by Date: **Re: 10 questions on QM postulates**
- Previous by thread: **Re: questions about UTC time, definitions, leap seconds, and measurement.**
- Next by thread: **Re: questions about UTC time, definitions, leap seconds, and measurement.**
- Index(es):
 - ◆ **Date**
 - ◆ **Thread**