

REFERENCE: http://www1.bipm.org/en/si/si_brochure/chapter2/2-1/second.html

SI brochure, section 2.1.1.3 (and *Supplement 2000*)

The unit of time, the second, was at one time considered to be the fraction $1/86\,400$ of the mean solar day. The exact definition of "mean solar day" was based on astronomical theories. However, measurements showed that irregularities in the rotation of the Earth could not be taken into account by the theory and have the effect that this definition does not allow the required accuracy to be achieved. In order to define the unit of time more precisely, the 11th CGPM (1960, **Resolution 9**) adopted a definition given by the International Astronomical Union (IAU) which was based on the tropical year. Experimental work, however, had already shown that an atomic standard of time interval, based on a transition between two energy levels of an atom or a molecule, could be realized and reproduced much more precisely. Considering that a very precise definition of the unit of time is indispensable for the International System, the 13th CGPM (1967-1968, **Resolution 1**) replaced the definition of the second by the following:

The second is the duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium 133 atom.

At its 1997 meeting, the CIPM affirmed that:

This definition refers to a caesium atom at rest at a temperature of 0 K.

This note was intended to make it clear that the definition of the SI second is based on a Cs atom unperturbed by black-body radiation, that is, in an environment whose temperature is 0 K, and that the frequencies of primary frequency standards should therefore be corrected for the shift due to ambient radiation, as stated at the meeting of the CCTF in 1999.

NEW TIME INTERVAL, Decimal Second (s_d)

Derivation & Definition

All years shall have 52 weeks, OTHER THAN THOSE YEARS DIVISIBLE BY SIX (6), which shall have an added 53rd week as 'Leap Week of the Year XXXX' during a cycle of 896-years/159 Leap Weeks cycle; there shall be 149 Leap Weeks (div.6) PLUS 10 LWks – to be called Keplers' Leap Weeks of the Year XXXX – that give Mean Year= $7 \cdot (52 + 159/896) = 365.2421875$ Mean Atomic Days.

Since 896 is not divisible by 6, $3 \cdot 896 = 2688$ -years cycle has 477 Leap Weeks, needing only 29 Additional Keplers' Leap weeks – thus omitting ONE Leap Week – with same Mean Year (i.e. $7 \cdot (52 + 1/6 + 29/2688) = 365.2421875$ days. **The solar day can also be of $24h_d \times 100m_d \times 100s_d$ (or 240000 decimal seconds, s_d) in place of $24h \times 60m \times 60s$ (or 86400 SI-seconds) on the clock time. The period over 364 days can be heaped over to have 5 years of 52 weeks **and the 6th year to have an added 53rd week, as 'leap week of the year',** according to the Leap Week Rule.**

A method for defining a fixed 'Blip or tik' unit based on the SI second is under consideration. A blip may be designated, as from the fixed second (fs) by consideration that there are 86,400-atomic seconds during the day, and there are 240000 decimal seconds in a day/chron.; and if day distribution is made into 1000000 (10^6) blips using the new time interval, decimal second (s_d); each blip is thus 0.24 decimal seconds, and may be expressed as $tt0-10\text{ ffs}_d$; and $tt10-$ to be 100th marker ($ff\ s_d$). This is 100000 (10^5) 'Blip or tik' from fixed Decimal Second. The chron, that is The Decimal Second (s_d) fixed from 'atomic second' shall be likewise designated as T- s_d (equal to $1/240000^{\text{th}}$ of atomic day).

DURATION of time INTERVAL: The SI-atomic second is the duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium –133 atom." (SI 2.1.1.3). From this, a 'BLIP' fixed to form the 'interval' for Decimal Second (s_d) would be derived from $[9,192,631,770 \times 0.36 = 3309347437.2]$ or *3309347437.2 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the Caesium–133 atom, per SI 2.1.1.3 (subject to calculation or application of measure being validated)*. Alternately, one 'BLOP' or $(tt-10) \text{ ffd}_s$ ($3.6 s_d$) would be 33093474372 periods per SI 2.1.1.3 (*subject to calculation or application of measure being validated*).

The cgs/MKS/MKSA or even the SI-second used only the multiples & sub-multiples of the time unit- second (s), whenever decimal parts of time were required to be used. Is it, therefore, not ripe to use Decimalisation of Time of the Hour and link with 'decimalised' arc-angle i.e. $\pi/180$ (or 1-degree)?

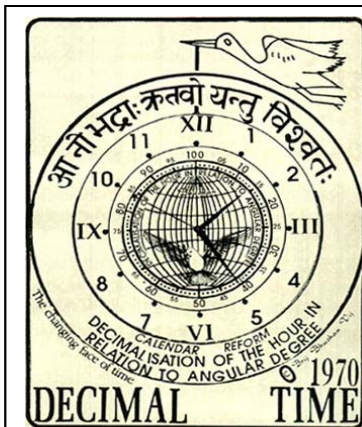
REVISING Average Mean Atomic Year Value (Y_{2007}):

According to http://en.wikipedia.org/wiki/Tropical_year: The current values and their annual change of the time of return to the cardinal ecliptic points are: (1) vernal equinox: $365.24237404 + 0.00000010338 \times a$ days; (2) northern solstice: $365.24162603 + 0.00000000650 \times a$ days; (3) autumn equinox: $365.24201767 - 0.00000023150 \times a$ days; and (4) southern solstice: $365.24274049 - 0.00000012446 \times a$ days, where a is number of years after Y_{2000} . I consider the YEAR length can be fixed at the Average Mean Atomic Year i.e. $[365.24237404 + 365.24162603 + 365.24201767 + 365.24274049] / 4 = 365.2421895575$ days. Astronomers, however, have fixed the Year value, $Y_{2000} = 365.242189669781$ days. This during the past century, Y_{1900} was 365d 5h 48m 45s.9747 i.e. 365.24219878125 days".

In my works, I have aimed to get Mean Year value at: $(365+31/128) = 365.2421875$ days, using div.4/skip 128th years (for Leap Days count); or $(7*128) = 896$ -years/159 LWks to give Mean Year = $(365+159/896) = 365.2421875$ days = $7*(52+1/6+29/2688)$. I now propose to fix, $Y_{2007} = 365.2421875$ atomic-days and align with $Y_{2000} = 365.242189669781$ days, thus *ratio $365.242189669781 / 365.2421875 = 1.000000005940663686338260144168^*$. This also, mean that 'New Atomic Day = 86400.00051327334 25 atomic second'; each atomic second of 794243389646333 cycles of Cs-133 at hyperfine levels.

Accordingly, decimal second = 3309347457 periods of radiations of Cs-133 at hyperfine levels.

I, therefore, define the 'time interval' decimal second (s_d) as:



DEFINITION

ONE DECIMAL SECOND (s_d) is the time interval between any TWO events that take place during the of the atomic day (of 86,400 atomic seconds) and to 3309347457 periods of radiations of cesium–133 atom, defined hyperfine levels, when the atom is at rest.

This is 36 % of the SI-second; or 1/87658125th of the modern astronomer's mean tropical year measured at the epoch, basis VSOP82, AD 2000.00 and corrected to Y 2007.

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In my mail to Karl (20031110), I wrote:

"Duration for the year (Y_{2000}) = 365d 5h 48m 45s.187469 or 31556925s.187469 SI-atomic seconds (=87658125.5207472 s_d). At start of last century, Y_{1900} this was 365d 5h 48m 45s.9747 or 3155692 5s.9747 SI-atomic seconds. Thus, it has changed only by 0.787231s in 100 years or (0.00787231s per year). A ONE second difference, therefore, shall occur in about 127 years. Determination of 'time interval decimal second' is NOT a very big issue, for CCDS & CCU".

Reference: http://www1.bipm.org/en/si/si_brochure/chapter2/2-1/metre.html

The Length Unit – METRE:

SI brochure, section 2.1.1.1

The 1889 definition of the metre, based upon the international prototype of platinum-iridium, was replaced by the 11th CGPM (1960) using a definition based upon a wavelength of krypton 86 radiation. This definition was adopted in order to improve the accuracy with which the metre may be realized. In turn, this was replaced in 1983 by the 17th CGPM (Resolution 1):

The metre is the length of the path travelled by light in vacuum during a time interval of 1/299 792 458 of a second.

Note that the effect of this definition is to fix the speed of light at exactly 299 792 458 m · s⁻¹. The original international prototype of the metre, which was sanctioned by the 1st CGPM in 1889 (CR, 34-38), is still kept at the BIPM under conditions specified in 1889.

LENGTH AS A MEASURE OF TIME at Velocity of Light (1973 April): ONE light year is a measure of 'distant stars'. This by definition is the distance traversed by light in a period of 'one (atomic) year' and equals 8502838125.031023494 m'/s_d. Scientists working under Dr. Kenneth M. Evanson at National Bureau of Standards bettered the 'measured' velocity of light to New accuracy of 186282.39593276 miles per second i.e. 299.7924562 x 10⁸ metre per second (existing time scale). This figure work to 107.925284232 x 10⁸ Metre New (m') per decimal second (s_d).

This improved value was reported in the TIME Magazine, New York in their issue dated 4 December 1972; and re-worked to express ***METRE in terms of time interval*** in my work: The Metric Second published by Indian Standards, New Delhi in their Bulletin V25 N4 (1973 April), about which I have referred earlier.

Re-Defining: METRE (m') – the New Length Unit

Why is it that the 'Nautical Mile' could not be shelved, to favor a more logical Nautical Kilometre? It is here, that I urge the consideration of dividing the 'hour' into 100 parts, and merge the arc-angle as: '*1/100TH of one degree*' to become the Nautical Kilometre, and keep intact the clock face with 24-hour zones (**each of 15^o/h**) on Earth, along with the 7-day 'Sabbath' cycle, the 364 day or 52-week year & a 'leap week' every sixth (6) year following the Leap Week Rule. Since most of the ready to use astronomical data is available, I consider time has come for taking a *socio-scientific and politico-economic* consideration of the 'calendar question' and use *decimalised Hour- Angle* in science and day-to-day life. This is no 'metric' as some friends have said! And, *why not: 'if I may ask, when this has a direct relation with the length unit, new metre (m')?'* For comprehensive details, please refer *Shelving Nautical Mile in Favor of Nautical Kilometre; Proceedings of 3rd International Conference MMGT 2001*; pp 164 through 169; National Physical Laboratory, New Delhi; 8 – 10 February 2001. Please see:

http://www.brijvij.com/bbv_shelving-NMile.pdf

The 360-degree (°) to a circle and 90° to the 'quadrant' are retained. Like 'hours & minutes' on the clock face; each degree (in angle) has 100 decimal minutes (and each decimal minute has 100 decimal seconds) unlike the present 1° x 60' x 60". The Nautical Kilometre (decimal) works to:

$$1 \text{ n Km}' = 1.11194886884 \text{ Km.}$$

Using the known value for the 'velocity of light', mean distance of Earth from the Sun is 1.3445587453 x 10⁸ Km'; and the distance METRE, after correction, can be defined as:

'Metre (m') is the distance traversed by light, in vacuum, during the time interval, 1/97059575.22TH of the decimal second'. Since '*1/100TH of π/180 (one degree)*' is to be the Nautical Kilometre; length distance METRE (m') can be seen as: 10^{^5}th or 1/100000th of the degree.

In Systeme Internationale d'Unites (SI) all derived units, dimensions & quantities can easily be derived by using: (1) time conversion factor, t_f = 0.36, and (2) distance conversion factor, d_f = 1.11194886884.

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<i>Sl.No.</i>	<i>TITLE</i>	<i>Registration</i>	<i>©Date Registered</i>
1.	Metric Second	Literary: L.5996/72	27 October 1972
2.	Metric Mathematical Tables	Literary: L.6009/72	29 November 1972
3.	Evolution of Metric Time Concept	Literary: L.6010/72	29 November 1972
4.	The Metric Calendar Year	Literary: L.6126/73	26 March 1973
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