DARRENLONGDEV

AstroClock

Operating Instructions

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Developed by Darren Long - https://darrenlongdev.wordpress.com/
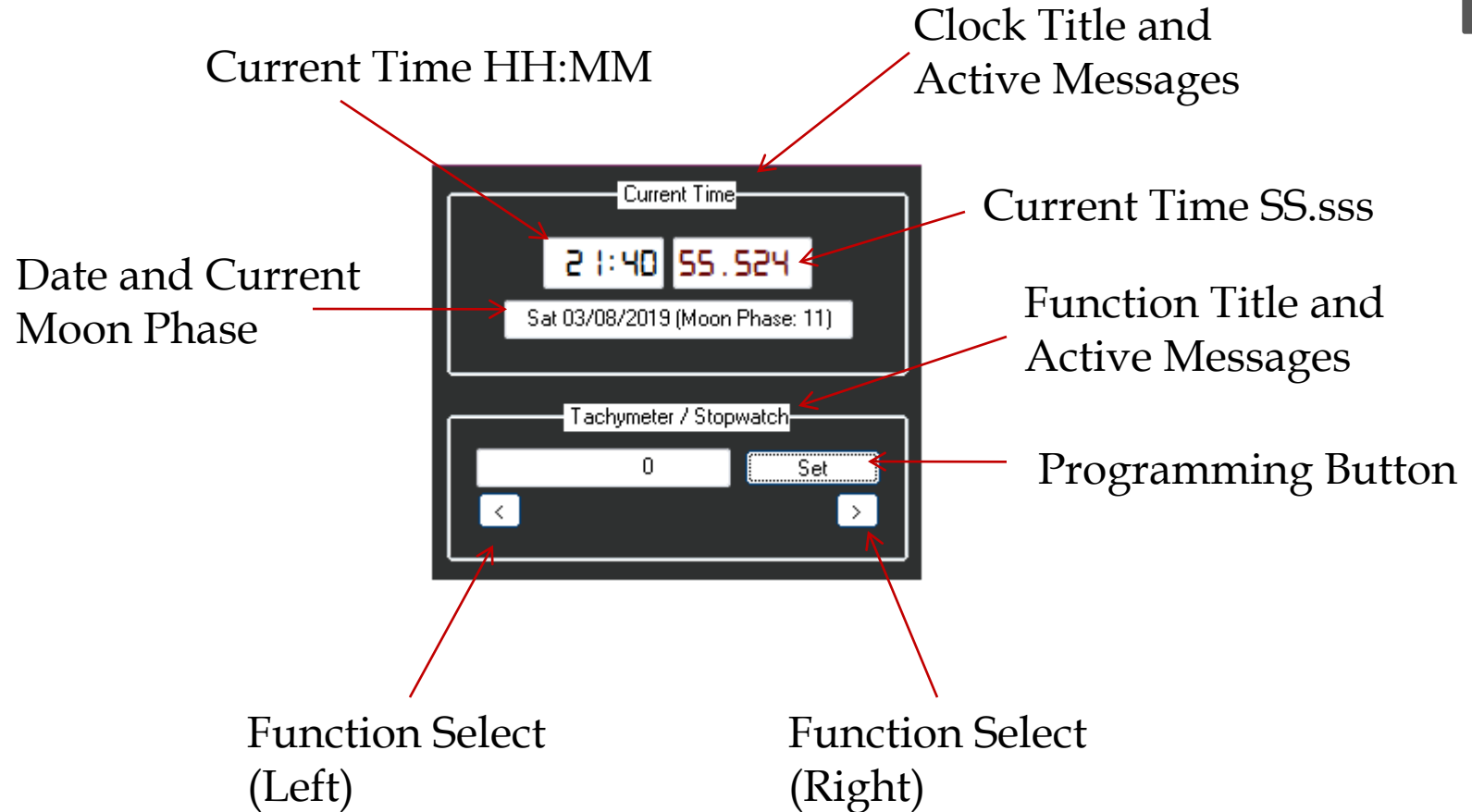
CONCEPT

This clock was designed as a functional homage to two wrist watches and the computer onboard the Saturn V rockets, all playing their part in mankind's exploration of space.

The OMEGA SPEEDMASTER, of 5 watches from different brands submitted to NASA, only this model survived the vigorous testing and went on to be worn on the moon! This clock features its stopwatch and tachymeter functions.

The OMEGA SPEEDMASTER SKYWALKER X-33, this both analogue and digital watch was developed for the European Space Agency to assist astronauts in planning their mission tasks. This clock bundles in the majority of its functions.

The SATURN V GUIDANCE COMPUTER used a system of Verbs and Nouns, this clock has been programmed so that each function is assigned a verb, each function then has 8 nouns (variables) available to it. The clock automatically knows the correct set of nouns to use by the function that is currently selected.

LAYOUT

Current Time HH:MM

Clock Title and
Active Messages

Current Time SS.sss

Date and Current
Moon Phase

Current Time

21:40 55.524

Sat 03/08/2019 (Moon Phase: 11)

Function Title and
Active Messages

Tachymeter / Stopwatch

0   Set

<   >

Programming Button

Function Select
(Left)

Function Select
(Right)

i *Right click to access the context menu*
Press F1 to access the help file

CURRENT TIME AND DATE

This clock takes its time from your systems UTC clock, and the time zone from your regional settings. So ensure your computer clock is set correctly either manually or via a time server (SNTP). You can change your systems UTC clock by right clicking the clock and selecting Set UTC Date and Time.

The date window also shows the current moon phase, indicating how much of the moon will be visible assuming a clear night sky.

The time is in a 7 segment display type, alike that on the OMEGA SPEEDMASTER SKYWALKER X-33, and the seconds are displayed in red and include milliseconds to mimic a sweeping second hand alike the watch.
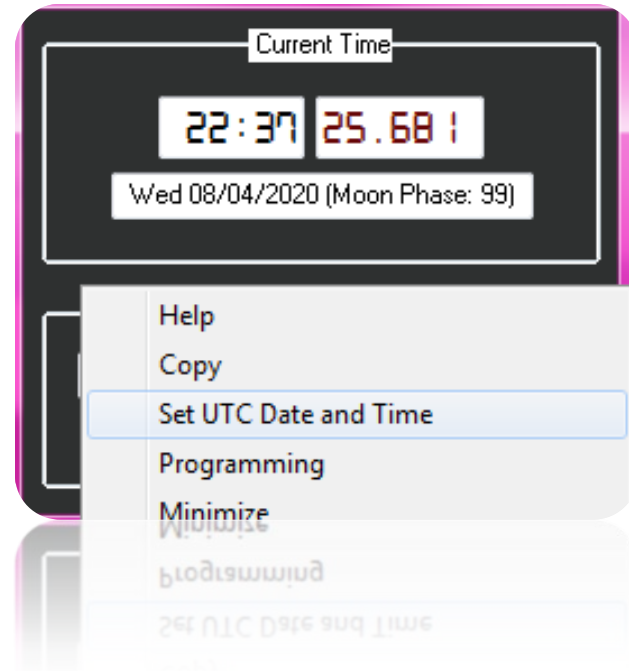
TACHYMETER / STOPWATCH

A tachymeter enables you to identify the speed of an object by the time it takes to travel between two points of a known distance. So if something travelled between two objects you know to be a mile apart, in 60 seconds, it would be doing one mile per minute.

Press the set button to start the stopwatch, note that the button now displays the stopwatch, press the button again to split, record the time and calculate the speed by tachymeter.
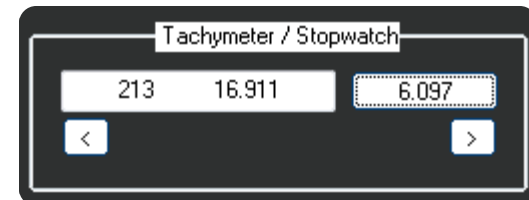
COORDINATED UNIVERSAL TIME (UTC)

This measurement of time is universal, all time zones are set with a bias from it. Unlike GMT, its not adjusted for daylights savings time. It is used as a time standard for aviation and space missions.

Press the format button to change the display of the date to UK standard.
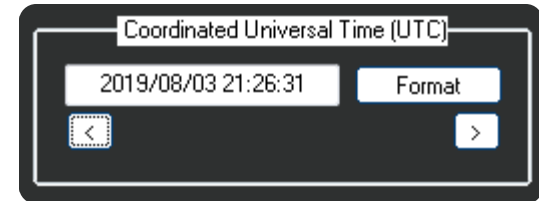
MISSION ELAPSED TIME (MET)

Mission Elapsed Time is a measurement of time from the start of a mission, particularly used in space missions.

On pressing the Set button, the clock counts forward in normal days, hours, minutes, and seconds. Press it again to reset and count up from 0.

PHASE ELAPSED TIME (PET)

Phase elapsed time can be used to count down the time remaining to an event, and the elapsed time since an event. Similar to how the Test counter (T-) and MET counters work during a rocket launch.

Press the Program button, enter the specified time in the following format
YYYY/MM/DD HH:MM:SS
Then press Program again to set.

There are two PET counters available in this clock, PET1 and PET2.

i The "-" sign indicates that the event is in the future. The "+" sign indicates that the event is in the past.

PHASE ELAPSED TIME (PET) (cont.)

A time offset can be enabled in programming mode. This allows you to easily adjust for events that are occurring in a different time zone.

PET 1
Verb 3, Noun 7 – Set an offset in minutes, precede with a "-" for negative values.

PET 2
Verb 4, Noun 7 – Set an offset in minutes, precede with a "-" for negative values.

[i] *To prevent errors, always program the phase elapsed timer prior to programming the offset value.*

ALARMS

There are two alarms available in this clock, Alarm 1 and Alarm 2.

They are set by Hours and Minutes, once set, the alarm will sound every day once the set time is reached, until the alarm is disabled by the user. The user could coincide these alarms with the PET counters to sound an alarm when PET +0 is reached.

The current time will illuminate green for 30 seconds once the alarm time is reached, and an active message will be displayed to indicate if Alarm 1 or Alarm 2 is reached.

To set the alarm press Set, enter the time in the following format HH:MM, then press set again.

Deadline
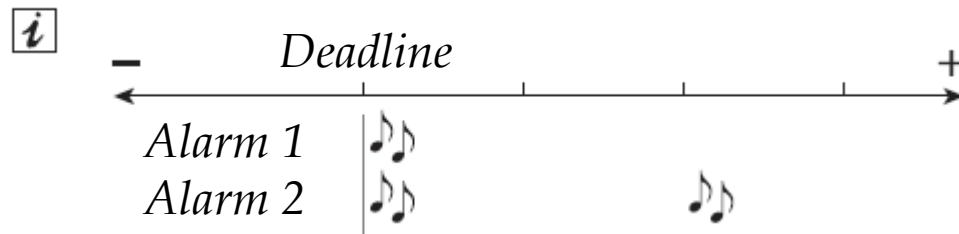
Alarm 1
Alarm 2

ALARMS (cont.)

There are two additional features that can be enabled in programming mode.

Alarm 1
Verb 5, Noun 6 – If set to 1, will clear the alarm setting after time is reached
Verb 5, Noun 7 – Set the path of a file or application to launch it when time
                is reached

Alarm 2
Verb 6, Noun 6 – If set to 1, will clear the alarm setting after time is reached
Verb 6, Noun 7 – Set the path of a file or application to launch it when time
                is reached

Finally, the alarm sounds can be customised by changing alarm1.wav and alarm2.wav for alternative wav files with the same filenames.
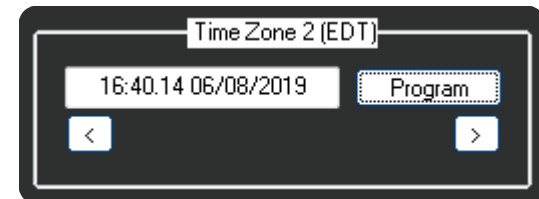
TIME ZONE 2

Its possible to display multiple time zones with this clock by setting the offset from UTC time of the time zone you require.

Press the Program button and enter the bias in hours, precede with a + or – symbol dependant on if the time zone is ahead or behind UTC. Press Program again to complete the programming.

Whilst most time zones on land are offset from UTC by a whole number of hours, a few zones are offset by 30 or 45 minutes, for this reason a mins() function has been included. The syntax is + or – mins(amount), for example +mins(45).

Additionally some common time zones including those where space ports are situated have been included and can be called via their abbreviations. Further information on these can be found overleaf.

Note that the bias is shown in the function title.

Time Zone 2 (EDT)

16:40.14 06/08/2019   Program

<   >

TIME ZONE 2 (cont.)

GMT, Greenwich Mean Time, UTC+0,
BST, British Summer Time, UTC+1,
EST, Eastern Standard Time, UTC-5, Cape Canaveral Air Force Station
EDT, Eastern Daylight Time, UTC-4, Cape Canaveral Air Force Station
PST, Pacific Standard Time, UTC-8, Vandenburg Air Force Base
PDT, Pacific Daylight Time, UTC-7, Vandenburg Air Force Base
CST, China Standard Time, UTC+8, Xichang Space Center
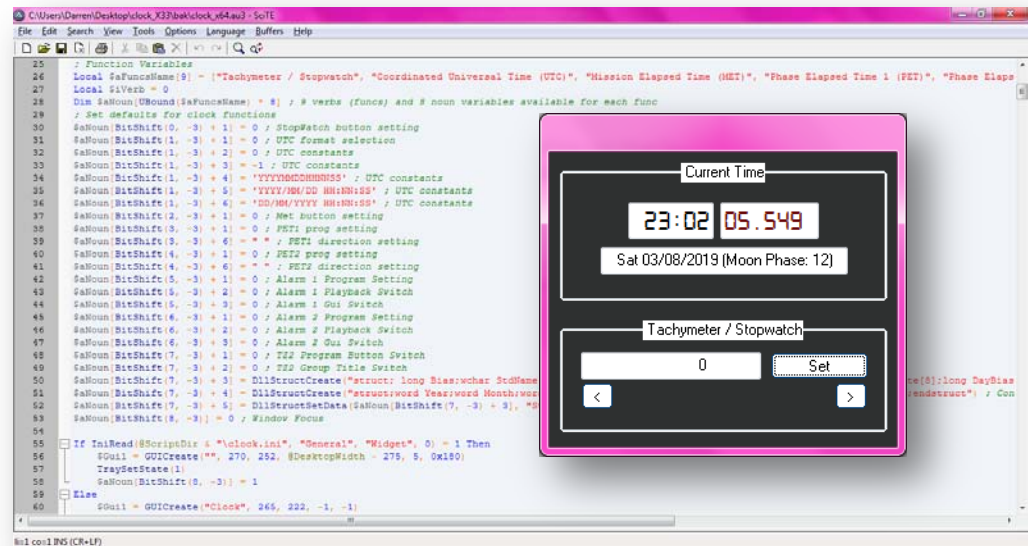**ALMT**, Alma-Ata Time, UTC+6, Baikonur Cosmodrome
**MSK**, Moscow Standard Time, UTC+3, Plesetsk Cosmodrome

WINDOW FOCUS

Window focus, when enabled, will put the clock in front of all other open windows on your computer.

Press the Set button to either enable or disable this feature.

EXAMPLE USAGE

A rocket launch is scheduled at Cape Canaveral and you want to tune into it from the UK. Firstly we can set Time Zone 2 to the local time at Cape Canaveral. We then note the time difference and set an alarm in our local time to coincide with the launch time. At the launch we start the MET counter to run in time with the MET counter of the mission.

T2   Alarm 1   MET

Set Time Zone 2 to EST

Set an alarm in local time for the launch

Start MET at rocket launch
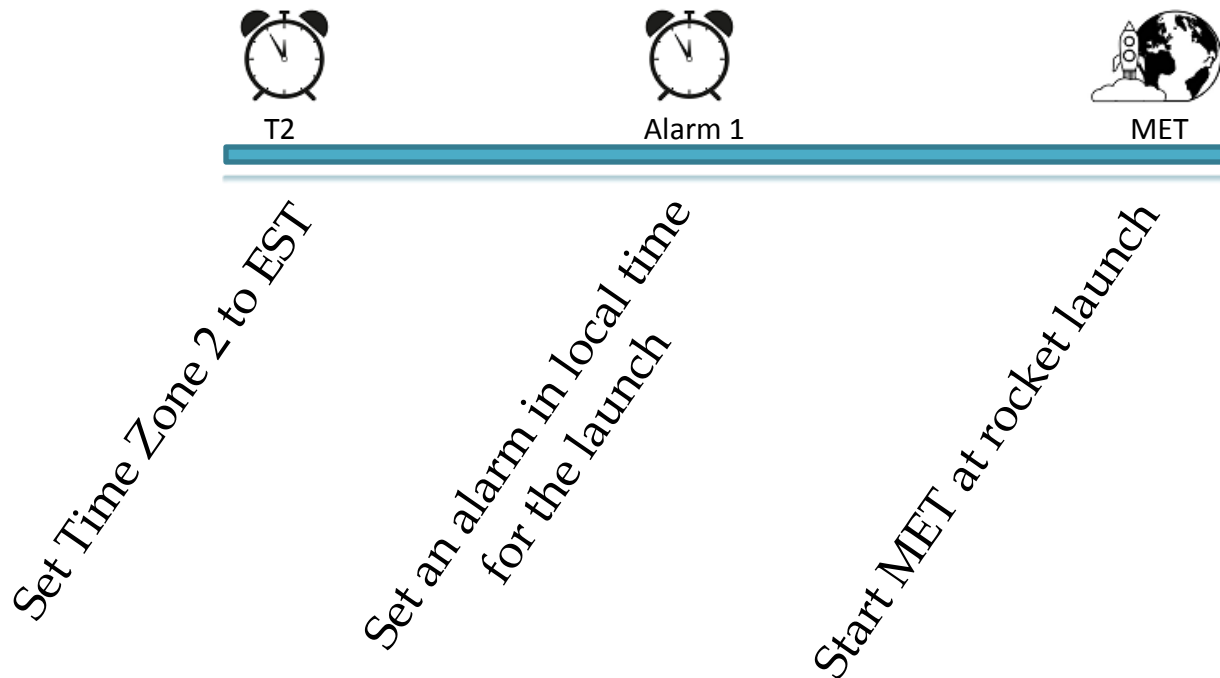
SYSTEM COMPATIBILITY

Windows operating system from Windows XP onwards, developed on 7.

x64 build compatible with x64 OS only, an x32 build compatible with both x32 and x64 OS is available from the developer.

Ensure that MS Sans Serif font is installed.

Required disk space: <20mb
Estimated memory usage: 3,000k
Recommended CPU specification: 2ghz+

Programming mode (selectable from the context menu), allows the entry of data or AU3 code. This mode should only be used by experienced users as can cause application crashes. Avoid the entry of (,),@ characters unless executing AU3 code.

LICENSING

Please also note:
1.   AstroClock's source code and executable files remain the property of Darren Long. You may not decompile, reverse engineer, disassemble, adapt, improve, modify or enhance any of AstroClock's executable files in any way. Only customizations made on your behalf by Darren Long are considered acceptable.

2. No warranty or ongoing product support is provided with AstroClock. Support may be available either for a fee or free of charge at the discretion of Darren Long.

3. The software is installed and used at your own risk, the entire risk as to the quality and performance of the program is with you. Should the program prove defective, you assume the cost of all necessary servicing, repair or correction. Darren Long cannot be held responsible for damage or loss of files that arise from the use of AstroClock.

CREDITS

Digital font was derived from Digital 7 Mono by Sizenko Alexander.

Alarm sounds included in the package were obtained from SoundBible.com.

Application icon based on a photo of an Omega Speedmaster Skywalker X-33.

This manual has been produced in a similar style to an Omega manual, featuring similar graphics, and some redrawn from an Omega manual. Icons on example usage page are taken from ClipDealer and VectorStock.

The Space Shuttle image is taken from Nasa's archives and the atlas of space ports is by Soren Walljasper.

Finally, I couldn't have made this software without the AutoIt forum, code snippets and general advise on there have helped me to develop my skills massively over the last ten or so years.

I personally use this clock in my home observatory, where the dark colours of its GUI aid in maintaining a dark environment. I also use its UTC functions to help me tune into rocket U.S launches from the UK.

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