# SMPTE Timecode

Whenever more than one device - software, hardware, computer etc. - are used simultaneously to create one final thing - e.g. a movie with music, or a lightshow running in sync to music or to a video - then a way to synchronize all devices is required. SMPTE Timecode is something like the standard for such a task: the timecode master sends a continuous stream of data which permanently states the time the master has advanced into the show/track/clip. And all other devices - here: timecode slaves - are to react to the very time as programmed in each device.

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| **More info on Linear Timecode** | https://en.wikipedia.org/wiki/Linear_timecode |
| **More info om SMPTE Timecode** | https://en.wikipedia.org/wiki/SMPTE_timecode |
| **Signal** | digital audio signal, 80 bit per frame |
| **Framerate** | 24, **25**, 29.97, 30 fps |
| **Connector/Cables** | usually 3 pin XLR. |

From https://en.wikipedia.org/wiki/Linear_timecode#Generation_and_Distribution:

> In broadcast video situations, the LTC generator should be tied into house black burst, as should all devices using timecode, to ensure correct color framing and correct synchronization of all digital clocks. When synchronizing multiple clock-dependent digital devices together with video, such as digital audio recorders, the devices must be connected to a common word clock signal that is derived from the house black burst signal. This can be accomplished by using a generator that generates both black burst and video-resolved word clock, or by synchronizing the master digital device to video, and synchronizing all subsequent devices to the word clock output of the master digital device (and to LTC).
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> Made up of 80 bits per frame, where there may be 24, 25 or 30 frames per second, LTC timecode varies from 960 Hz (binary zeros at 24 frames/s) to 2400 Hz (binary ones at 30 frames/s), and thus is comfortably in the audio frequency range. LTC can exist as either a balanced or unbalanced signal, and can be treated as an audio signal in regards to distribution. Like audio, LTC can be distributed by standard audio wiring, connectors, distribution amplifiers, and patchbays, and can be ground-isolated with audio transformers. It can also be distributed via 75 ohm video cable and video distribution amplifiers, although the voltage attenuation caused by using a 75 ohm system may cause the signal to drop to a level that can not be read by some equipment.
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> Care has to be taken with analog audio to avoid audible 'breakthrough' (aka “crosstalk”) from the LTC track to the audio tracks.
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> LTC care:
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> * Avoid percussive sounds close to LTC
> * Never process an LTC with noise reduction, eq or compressor
> * Allow pre roll and post roll
> * To create negative time code add one hour to time (avoid midnight effect)
> * Always put slowest device as a master

From:
https://www.avosupport.de/wiki/ - **AVOSUPPORT**

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**https://www.avosupport.de/wiki/external/smpte_timecode?rev=1577361189**

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