

G04G

ELECTRONIC TIME-PIECES

Definition statement

This place covers:

The definition of an electronic timepiece is: a timepiece in which the time reference (signal) is obtained solely by electronic means.

Given the above definition, [G04G](#) covers purely electronic timepieces, namely, electronic timepieces with no moving parts. [G04G](#) also covers purely electronic aspects of timepieces having moving parts.

Relationships with other classification places

For the overlaps with [G04C](#), see the corresponding section therein.

[G04G](#) may overlap with [H04M 1/725](#) and subgroups as well as with [H04B 1/385](#) for documents showing mobile telephones in the form of watches or used according to their timing aspects.

References

Limiting references

This place does not cover:

Electromechanical timepieces; Electromechanical aspects of electronic timepieces	G04C
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Special rules of classification

It should always be borne in mind that every document showing a timepiece which is not purely mechanical could potentially be classified in [G04G](#) and/or [G04C](#). There are mainly two reasons for this:

- 1) Often it happens that the nature (electronic or electromechanical) of the timepiece is not the central point in a document. For example, in some cases, despite the presence of moving parts, the core of the document is focused on purely electronic aspects, therefore this document would be classified rather in [G04G](#) than [G04C](#).
- 2) [G04C](#) and [G04G](#) follow a structure which is only partly parallel (see also the definition of [G04C](#)). For example, whilst [G04G 15/00](#) finds an equivalent group in [G04C 23/00](#), other groups such as [G04G 17/00](#), [G04G 19/00](#) or [G04G 21/00](#) have no equivalent in [G04C](#). For this reason, in the practise, some groups of [G04G](#) are still used to classify documents showing timepieces with moving parts and for which [G04C](#) does not offer a technically detailed possibility for classification.

G04G 3/00

Producing timing pulses (driving circuits for stepping motors [G04C 3/14](#); producing preselected time intervals for use as timing standards [G04F 5/00](#); pulse technique in general [H03K](#); control, synchronisation, or stabilisation of generators in general [H03L](#))

Definition statement

This place covers:

Documents describing electronic circuits which are usually combined with an oscillator in order to deliver timing pulses in a timepiece.

References

Limiting references

This place does not cover:

Driving circuits for stepping motors of timepieces	G04C 3/14
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for generating time reference signals	G04F 5/00
pulse technique in general	H03K
control, synchronisation, or stabilisation of generators in general	H03L

G04G 3/02

Circuits for deriving low frequency timing pulses from pulses of higher frequency (pulse frequency dividers in general [H03K 23/00](#) - [H03K 29/00](#))

Definition statement

This place covers:

Frequency dividers, the further breakdown of the classification being self-explaining.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

pulse frequency dividers in general	H03K 23/00 - H03K 29/00
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G04G 3/04

Temperature-compensating arrangements

Definition statement

This place covers:

Compensation arrangements for temperature-induced drifts in clocks. The compensations can be either hardware, namely implementing TCXO or "software", namely measuring temperature and correcting the timing pulses by applying predetermined correcting factors obtained using parabolic or cubic models.

Relationships with other classification places

Concerning the above limitation with respect to [G04F 5/00](#), it is noted that [G04G 3/00](#) is generally focused on the electronic circuits which deliver the actual timing pulse generated by an oscillator, whereas [G04F 5/00](#) focuses on the generation of the reference frequency itself.

G04G 5/00

Setting, i.e. correcting or changing, the time-indication (radio-controlled time-pieces [G04R](#))

Definition statement

This place covers:

Documents in which details concerning either the hardware or the methods of setting time in electronic timepieces are described.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

synchronisation combined with automatic setting at regular intervals, e.g. by coded signals	G04G 7/00
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Special rules of classification

The expression "time setting" should be intended as an operation which results in the time information as currently measured and displayed by the timepiece to be updated to a (more reliable) value. Time setting can be "immediate", when the updated information is directly overwritten to the pre-existing one. Time setting can also be achieved after a period of merging between the pre-existing time value and the updated one.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Time setting	Operation which results in the time information as currently measured and displayed by the timepiece to be updated to a (more reliable) value.
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G04G 7/00

Synchronisation (radio-controlled time-pieces [G04R](#))

Definition statement

This place covers:

Documents describing synchronizations between electronic timepieces. In other words, it describes synchronization between devices which are conceived to measure and display time as their ultimate goal.

References

Limiting references

This place does not cover:

Documents describing synchronization between devices which are not regarded as timepieces, e.g. nodes in a telecommunication network or satellites belonging to a positioning system.

Special rules of classification

As an exception to the above statement, [G04G 7/00](#) can still contain documents which concern synchronization of clocks within telecom networks or satellite systems provided that they strictly related to time-of-the-day information being synchronized and made available to the user.

G04G 9/00

Visual time or date indication means

Definition statement

This place covers:

Both hardware aspects as well as methods related to the display of time, using electronic timepieces.

G04G 9/02

by selecting desired characters out of a number of characters or by selecting indicating elements the position of which represent the time, e.g. by using multiplexing techniques {([G04G 9/0082](#) takes precedence)}

Definition statement

This place covers:

The so called "analog electronic time displays". In this group, documents will be found showing time displays wherein one indicator refers to an external time scale (be it explicit or implicit) to indicate time. The typical example is an LCD or LED panel wherein each single display element has the shape of a watch hand, the one (or two) element(s) being lit simulating real, physical hands sweeping on a watch face.

G04G 9/08

by building-up characters using a combination of indicating elements, e.g. by using multiplexing techniques {([G04G 9/0082](#) takes precedence)}

Definition statement

This place covers:

The so called "electronic digital displays". Here, one or more character(s) are built-up, e.g. by combining several LED segments, the character(s) being per se capable of delivering the time information, without reference to an external scale.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

LCDs in general	G02F 1/00
Displays in general	G049F , G09G
Displays for mobile telephones	H04M 1/0266

Special rules of classification

Combination of [G04G 9/02](#) and [G04G 9/08](#) is represented by the documents in [G04G 9/0082](#).

[G04G 9/0023](#), although apparently limited by a strong precedence rule, is very important for what concerns illumination and back-light (see the lower breakdown). Searches in [G04G 9/0023](#) are often extended to [G02F 1/1335+](#), and/or [G02B 6/0001+](#).

[G04G 9/0064](#) has no equivalent in [G04C](#). Therefore, this subgroup contains documents showing timepieces with display of time in more than one time zone independently of the nature of the timepiece.

[G04G 9/0082](#) needs always to be searched in combination with [G04C 17/0091](#).

G04G 11/00

Producing optical signals at preselected times

Special rules of classification

This group corresponds, in [G04C](#), to [G04C 19/00](#) (please refer also to this definition).

[G04G 11/00](#) also completes [G04G 9/00](#) because it focuses on indicating one or more predetermined time visually. The subclass contains, among other, light-based alarms, e.g. for soft awakening of a sleeper.

G04G 13/00

Producing acoustic time signals

Special rules of classification

This subclass corresponds, in [G04C](#), to [G04C 21/00](#) (please refer also to this definition).

Contrary to [G04C 21/00](#), however, [G04G 13/00](#) does not have a specific entry for the classification of electronic "minute repeater", which will therefore be classified always in [G04C 21/00](#).

In line with the usual [G04C/G04G](#) practical distinction, this subclass contains mostly software/programming/managing details of alarm clocks, as opposed to the more mechanical/hardware aspects of [G04C 21/00](#).

G04G 15/00

Time-pieces comprising means to be operated at preselected times or after preselected time intervals ([G04G 11/00](#), [G04G 13/00](#) take precedence; {electronic timers [G04F 1/005](#)}; pulse delay circuits [H03K 5/13](#); electronic time-delay switches [H03K 17/28](#); electronic time-programme switches which automatically terminate their operation after the programme is completed [H03K 17/296](#))

Definition statement

This place covers:

Timepieces which are operable and/or programmable to execute predetermined operations at one or a plurality of predetermined times by means which are not optical nor acoustic.

Typical example is an electronically programmable thermostat or an electronic controller for window blinds.

References

Limiting references

This place does not cover:

Electronic timepieces producing optical time signals at preselected times	G04G 11/00
Electronic timepieces producing acoustic time signals	G04G 13/00
Electronic count-down timers	G04F 1/005

Informative references

Attention is drawn to the following places, which may be of interest for search:

Pulse delay circuits I	H03K 5/13
Electronic time-delay switches	H03K 17/28
Electronic time-programme switches which automatically terminate their operation after the programme is completed	H03K 17/296

Special rules of classification

This group corresponds, in [G04C](#), to [G04C 23/00](#) (please refer also to this definition).

Depending on the specific applications, some overlaps may be found with roller blinds ([E06B 9/40](#)), heating systems ([F04D 5/00](#), [F24D 11/00](#)).

Some overlaps could also be found with [G04F 1/005](#). The main difference between the two subgroups is: whilst in [G04G 15/00](#) the programmed action happens at a predetermined - measured and therefore known - time of the day, e.g. at 11h24, the devices of [G04F 1/005](#) merely count down starting from a preset time amount. Therefore, the devices of [G04F 1/005](#) are in principle not capable of telling time.

G04G 17/00

Structural details; Housings (constructional details of radio-controlled timepieces, e.g. antennas [G04R 60/00](#))

Definition statement

This place covers:

Hardware details concerning mainly two aspects:

[G04G 17/02](#) and subgroups concerns details on how one or more components of the timepiece are assembled with or within the overall structure of the timepiece. For example, it concerns the mounting of the display, the mounting of a sensor inside or onto the timepiece case, etc.

For mountings that could be applied also to mechanical timepieces please refer to [G04B 37/00](#).

[G04G 17/08](#) and subgroups concerns details of the watch case, with the "special cases" represented by watches distributed over several housings (with wired and/or wireless interaction thereof) as well as desktop clocks.

For mountings that could be applied also to mechanical timepieces please refer to [G04B 37/00](#).

References

Limiting references

This place does not cover:

Constructional details of Radio Controlled Timepieces	G04R 60/00
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G04G 19/00

Electric power supply circuits specially adapted for use in electronic timepieces

Special rules of classification

The ECLA titles for this subclass are considered to be self-explaining.

Depending on the specific case, searches in this technical area are often extended to [H02J 7/00](#) and subgroups.

Particular attention is drawn to [G04G 19/12](#). This subclass obviously covers the case of purely electronic displays (e.g. LED based) which are switched off when no time display is presumably needed. Nonetheless, due to a lack of an equivalent subclass in [G04C](#), [G04G 19/12](#) also covers the same technology as applied to electromechanical displays, where hands are stopped, e.g., in low illumination conditions. Often the latter case is searched in combination with [G04C 3/14](#) and subgroups as well as with keywords dedicated to the detection of hands positions. If the documents contain details concerning the particular switch used to turn on-off the display, then also [G04C 3/001](#) and subgroups should be considered.

G04G 21/00

Input or output devices integrated in time-pieces

Definition statement

This place covers:

- Measuring devices integrated in timepieces (currently classified in [G04G 21/02](#) and subgroups).
- More "classic" user interfaces.

Special rules of classification

G04G1/02 and subgroups has been planned, within an IP5 reorganization project, to be moved to a dedicated IPC group, thereby separating the measuring instruments and leaving in [G04G 21/00](#) only the properly named I/O devices.