

H03L

AUTOMATIC CONTROL, STARTING, SYNCHRONISATION, OR STABILISATION OF GENERATORS OF ELECTRONIC OSCILLATIONS OR PULSES (of dynamo-electric generators H02P)

Definition statement

This subclass/group covers:

Automatic control circuits for generators of electronic oscillations or pulses; starting, synchronization, or stabilization circuits for generators where the type of generator is irrelevant or unspecified.

References relevant to classification in this subclass

This subclass/group does not cover:

This subclass does not cover stabilisation or starting circuits specially adapted to only one specific type of generator, which are covered by subclasses [H03B](#), [H03K](#).

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subclass, the following expression is used with the meaning indicated:

automatic control	covers only closed loop systems
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H03L 1/00

Stabilisation of generator output against variations of physical values, e.g. power supply (automatic control H03L5/00, H03L7/00)

Definition statement

This subclass/group covers:

Stabilisation of generator output against variations caused by environmental variations such as temperature, process variations when the generator is (partly) integrated on an electronic chip, aging of the components constituting the generator.

Informative references

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

Modifications of generator, of oscillations using amplifier with regenerative feedback from output to input, to compensate for variations in physical values.	H03B 5/04
Modifications of generator, for generating electric pulses, to compensate for variations in physical values.	H03K 3/011
Against variations of temperature only	H03L 1/02

Special rules of classification within this group

Documents disclosing compensation against temperature variations and against another physical parameter are classified in the subgroup [H03L 1/02](#) in addition to [H03L 1/00](#).

H03L 1/021

[N: of generators comprising distributed capacitance and inductance]

Definition statement

This subclass/group covers:

Said distributed capacitances and inductances could be also delay lines, micro-strips, and the like.

H03L 1/023

[N: by using voltage variable capacitance diodes]

Definition statement

This subclass/group covers:

All devices having a variable capacitance e.g. Junction capacitors, MOS-capacitors, and the like.

H03L 1/04

Constructional details for maintaining temperature constant

Definition statement

This subclass/group covers:
also ovens for maintaining temperature constant

H03L 5/00

Automatic control of voltage, current, or power

Definition statement

This subclass/group covers:
Arrangements for automatic controlling the output level/amplitude of the generator. The output of the generator could be a voltage, current or power.

References relevant to classification in this group

This subclass/group does not cover:
Control of voltage, current or power wherein the generators are not generators for electronic oscillations or pulses e.g. level shifts, power management, power supply regulators, automatic transmission power control, etc.

H03L 5/02

of power

Definition statement

This subclass/group covers:
Arrangements for automatic controlling the output power level of the generator.

H03L 7/00

Automatic control of frequency or phase; Synchronisation (tuning of resonant circuits in general H03J; synchronising in digital communication systems, see the relevant groups in class H04)

Definition statement

This subclass/group covers:
All documents for automatic controlling the frequency or phase of the output of the generator.

H03L 7/02

using a frequency discriminator comprising a passive frequency-determining element

Definition statement

This subclass/group covers:

All means for converting the frequency to any of voltage, current or digital signal e.g. frequency-to-voltage converter, frequency-to-current converter, frequency-to-digital converter.

H03L 7/04

wherein the frequency-determining element comprises distributed inductance and capacitance

Definition statement

This subclass/group covers:

Distributed capacitances and inductances could be also delay lines, micro-strips, and the like.

H03L 7/06

using a reference signal applied to a frequency- or phase-locked loop

Definition statement

This subclass/group covers:

The reference signal is a frequency reference signal including constant frequency signal, data signal, and the like.

References relevant to classification in this group

This subclass/group does not cover:

Modulation signal (e.g. US2008032649)	H03C 3/0908
Modulated signal (e.g. US5625319)	H03D 3/241

H03L 7/07

using several loops, e.g. for redundant clock signal generation (for indirect frequency synthesis H03L7/22)

Definition statement

This subclass/group covers:

More than loop having each its own controlled oscillator and/or phase shifter.

References relevant to classification in this group

This subclass/group does not cover:

More than loop sharing a controlled oscillator and/or phase shifter with or without use of a switching means.	H03L 7/087
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H03L 7/0802

[N: the loop being adapted for reducing power consumption (H03L7/14 takes precedence)]

Definition statement

This subclass/group covers:

the "loop" meaning a Phase-locked loop (PLL) or a Delay-locked loop (DLL).

H03L 7/0807

[N: concerning mainly a recovery circuit for the reference signal]

Definition statement

This subclass/group covers:

Recovery circuit for recovering the reference signal from the input signal, e.g. data signal.

Informative references

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

Synchronisation of receiver with transmitter using the transitions of the received signal to control the phase of the synchronising-signal-generating means, e.g. using a phase-locked loop	H04L 7/033
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Synonyms and Keywords

DCR or CDR	data/clock or clock/data recovery
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H03L 7/081

**provided with an additional controlled phase shifter [N:
(H03L7/0998 takes precedence)]**

Definition statement

This subclass/group covers:

Controlled phase shifter in the loop e.g. delay element, phase selector, phase interpolator, and the like.

Special rules of classification within this group

This subgroup does not include additional phase shifter outside the loop e.g. in the reference path or in the output path.

H03L 7/0812

[N: and where no voltage or current controlled oscillator is used]

Definition statement

This subclass/group covers:

Delay-locked loops.

H03L 7/0814

[N: the phase shifting device being digitally controlled]

Definition statement

This subclass/group covers:

Controlled phase shifter which is digitally controlled e.g. by a register and/or an up-down counter.

H03L 7/083

the reference signal being additionally directly applied to the generator (direct frequency synchronisation without loop

H03L7/24)

Definition statement

This subclass/group covers:

Reference signal being additionally directly applied to the controlled oscillator in the loop.

H03L 7/085

concerning mainly the frequency- or phase-detection arrangement including the filtering or amplification of its output signal (H03L7/10 takes precedence; frequency or phase detection comparison in general H03D3/00, H03D13/00)

Definition statement

This subclass/group covers:

- Frequency or phase detectors generating an up-down output pulse signal at a single terminal, e.g. an EXOR gate.
- Frequency or phase detectors comprising a time-to-digital converter (TDC).

H03L 7/089

the phase or frequency detector generating up-down pulses (H03L7/087 takes precedence)

Definition statement

This subclass/group covers:

Phase or frequency detector generating up-down pulses at separate terminals of the detector.

H03L 7/0893

[N: the up-down pulses controlling at least two source current generators or at least two sink current generators connected to different points in the loop]

Definition statement

This subclass/group covers:

The up-down pulses being generated by the same phase or frequency detector.

H03L 7/0898

[N: the source or sink current values being variable (H03L7/0896 takes precedence)]

Definition statement

This subclass/group covers:

Means for adjusting or tuning the value of the source or sink current.

the phase or frequency detector using a sampling device ([H03L 7/087](#) takes precedence)

H03L 7/091

Definition statement

This subclass/group covers:

Phase or frequency detectors comprising sampling devices such as flip-flops, A/D converters, or the like.

H03L 7/093

using special filtering or amplification characteristics in the loop (H03L7/087 to H03L7/091 take precedence)

Definition statement

This subclass/group covers:

Loop filtering, amplification, or any other manipulation of the signal provided by the phase/frequency detector which results in a control signal for the controlled oscillator of the loop.

H03L 7/095

using a lock detector (H03L7/087 takes precedence)

Definition statement

This subclass/group covers:

Details of the lock detector.

References relevant to classification in this group

This subclass/group does not cover:

Lock detectors without any detailed features. The lock detectors without detailed features are classified in other subgroups according to the purpose/use of the said lock detector.

H03L 7/097

using a comparator for comparing the voltages obtained from two frequency to voltage converters

Definition statement

This subclass/group covers:

Frequency to voltage converters converting the frequency of the reference signal and the frequency of the feedback signal to a voltage, current or digital signal. The voltage, current or digital signal is used by the comparator.

H03L 7/0991

[N: the oscillator being a digital oscillator, e.g. composed of a fixed oscillator followed by a variable frequency divider (H03L7/0995 takes precedence; fixed oscillators with means for selecting among various phases H03L7/0814)]

Definition statement

This subclass/group covers:

Digital oscillators which are analogly or digitally controlled.

References relevant to classification in this group

This subclass/group does not cover:

Analog oscillators which are digitally or numerically controlled (DCO, NCO)	H03L 7/099
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H03L 7/0992

[N: comprising a counter or a frequency divider]

Definition statement

This subclass/group covers:

Counter or frequency divider being part of the controlled digital oscillator.

References relevant to classification in this group

This subclass/group does not cover:

Counters or frequency dividers which are part of the feedback path or output path outside the loop.	H03L 7/18
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H03L 7/0994

[N: comprising an accumulator]

Definition statement

This subclass/group covers:

Digital oscillators comprising an accumulator e.g. Direct Digital Synthesizers (DDS).

References relevant to classification in this group

This subclass/group does not cover:

Direct Digital Synthesizers DDS per se, which are not part of a PLL.	G06F 1/0321
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H03L 7/10

for assuring initial synchronisation or for broadening the capture range

Definition statement

This subclass/group covers:

Means for speeding up the lock-in of the loop in general.

H03L 7/107

using a variable transfer function for the loop, e.g. low pass filter having a variable bandwidth

Definition statement

This subclass/group covers:

Low pass loop filter having a variable bandwidth for the purpose of assuring synchronisation or broadening the capture range of the PLL.

References relevant to classification in this group

This subclass/group does not cover:

Low pass loop filter having a variable bandwidth for other purposes.	H03L 7/093
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H03L 7/14

for assuring constant frequency when supply or correction voltages fail [N: or are interrupted]

Definition statement

This subclass/group covers:

Arrangements and methods for assuring constant output frequency of the generator when the reference signal fails or interrupted, or when the control signal of the controlled oscillator of the PLL or the controlled delay of the DLL fails or interrupted due to any other cause.

H03L 7/185

using a mixer in the loop (H03L7/187 to H03L7/195 take precedence)

Definition statement

This subclass/group covers:

Mixer in addition to the frequency divider or counter.

References relevant to classification in this group

This subclass/group does not cover:

Mixer without a frequency divider or counter.	H03L 2207/12
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H03L 7/187

using means for coarse tuning the voltage controlled oscillator of the loop (H03L7/191 to H03L7/195 take precedence)

Special rules of classification within this group

When the means for coarse tuning the controlled oscillator is not specific for frequency synthesizers, the document would be (additionally) classified in the subgroup [H03L/10](#).

H03L 7/191

using at least two different signals from the frequency divider or the counter for determining the time difference (H03L7/193, H03L7/195 take precedence)

Definition statement

This subclass/group covers:

At least two different signals generated by the frequency divider or the counter or derived from frequency divider or counter output are used by the phase/frequency detector.

H03L 7/193

the frequency divider/counter comprising a commutable pre-divider, e.g. a two modulus divider (pulse counters/frequency dividers H03K21/00 to H03K29/00)

Definition statement

This subclass/group covers:

Also multi-modulus dividers.

H03L 7/1976

[N: using a phase accumulator for controlling the counter or frequency divider]

Definition statement

This subclass/group covers:

Also Delta-Sigma modulators used for controlling the counter or frequency divider.

H03L 7/22

using more than one loop

Definition statement

This subclass/group covers:

More than loop having each its own controlled oscillator and/or phase shifter.

References relevant to classification in this group

This subclass/group does not cover:

More than loop sharing a controlled oscillator and/or phase shifter with or	H03L 7/087
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without use of a switching means.	
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H03L 7/24

using a reference signal directly applied to the generator

Definition statement

This subclass/group covers:

e.g. injection-locked oscillators, oscillator arrays, mutually-coupled oscillators.

H03L 7/26

using energy levels of molecules, atoms, or subatomic particles as a frequency reference

Definition statement

This subclass/group covers:

e.g. atomic clocks.

H03L 9/00

Automatic control not provided for in other groups of this subclass