

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H03 ELECTRONIC CIRCUITRY

## H03L AUTOMATIC CONTROL, STARTING, SYNCHRONISATION OR STABILISATION OF GENERATORS OF ELECTRONIC OSCILLATIONS OR PULSES (generation of oscillations [H03B](#))

### NOTES

1. This subclass covers:
  - automatic control circuits for generators of electronic oscillations or pulses;
  - starting, synchronisation or stabilisation circuits for generators where the type of generator is irrelevant or unspecified.
2. In this subclass, the following expression is used with the meaning indicated:
  - "automatic control" covers only closed loop systems.

<b>1/00</b>	<b>Stabilisation of generator output against variations of physical values, e.g. power supply</b>	7/0805	. . . {the loop being adapted to provide an additional control signal for use outside the loop}
1/02	. against variations of temperature only		
1/021	. . {of generators comprising distributed capacitance and inductance}	7/0807	. . . {concerning mainly a recovery circuit for the reference signal}
1/022	. . {by indirect stabilisation, i.e. by generating an electrical correction signal which is a function of the temperature ( <a href="#">H03L 1/021</a> takes precedence)}	7/081	. . . provided with an additional controlled phase shifter {( <a href="#">H03L 7/0998</a> takes precedence)}
1/023	. . . {by using voltage variable capacitance diodes}	7/0812	. . . . {and where no voltage or current controlled oscillator is used}
1/025	. . . . {and a memory for digitally storing correction values}	7/0814	. . . . . {the phase shifting device being digitally controlled}
1/026	. . . {by using a memory for digitally storing correction values ( <a href="#">H03L 1/025</a> takes precedence)}	7/0816	. . . . . {the controlled phase shifter and the frequency- or phase-detection arrangement being connected to a common input}
1/027	. . . {by using frequency conversion means which is variable with temperature, e.g. mixer, frequency divider, pulse add/subtract logic circuit ( <a href="#">H03L 1/023</a> , <a href="#">H03L 1/026</a> take precedence)}	7/0818	. . . . . {the controlled phase shifter comprising coarse and fine delay or phase-shifting means}
1/028	. . {of generators comprising piezoelectric resonators ( <a href="#">H03L 1/021</a> , <a href="#">H03L 1/022</a> take precedence; oscillation generators with a piezoelectric resonator <a href="#">H03B 5/32</a> )}	7/083	. . . the reference signal being additionally directly applied to the generator
1/04	. . Constructional details for maintaining temperature constant	7/085	. . . concerning mainly the frequency- or phase-detection arrangement including the filtering or amplification of its output signal ( <a href="#">H03L 7/10</a> takes precedence; circuits for comparing the phase or frequency of two mutually-independent oscillations <a href="#">H03D 13/00</a> )
<b>3/00</b>	<b>Starting of generators</b>	7/087	. . . . using at least two phase detectors or a frequency and phase detector in the loop
<b>5/00</b>	<b>Automatic control of voltage, current, or power</b>	7/089	. . . . the phase or frequency detector generating up-down pulses ( <a href="#">H03L 7/087</a> takes precedence)
5/02	. of power	7/0891	. . . . . {the up-down pulses controlling source and sink current generators, e.g. a charge pump}
<b>7/00</b>	<b>Automatic control of frequency or phase; Synchronisation</b>	7/0893	. . . . . {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}
7/02	. using a frequency discriminator comprising a passive frequency-determining element	7/0895	. . . . . {Details of the current generators ( <a href="#">H03L 7/0893</a> takes precedence)}
7/04	. . wherein the frequency-determining element comprises distributed inductance and capacitance	7/0896	. . . . . {the current generators being controlled by differential up-down pulses}
7/06	. using a reference signal applied to a frequency- or phase-locked loop		
7/07	. . using several loops, e.g. for redundant clock signal generation		
7/08	. . Details of the phase-locked loop		
7/0802	. . . {the loop being adapted for reducing power consumption ( <a href="#">H03L 7/14</a> takes precedence)}		

- 7/0898 . . . . . {the source or sink current values being variable ([H03L 7/0896 takes precedence](#))}
- 7/091 . . . . the phase or frequency detector using a sampling device ([H03L 7/087 takes precedence](#))
- 7/093 . . . . using special filtering or amplification characteristics in the loop ([H03L 7/087 - H03L 7/091 take precedence](#))
- 7/095 . . . . using a lock detector ([H03L 7/087 takes precedence](#))
- 7/097 . . . . using a comparator for comparing the voltages obtained from two frequency to voltage converters
- 7/099 . . . . concerning mainly the controlled oscillator of the loop
- 7/0991 . . . . {the oscillator being a digital oscillator, e.g. composed of a fixed oscillator followed by a variable frequency divider ([H03L 7/0995 takes precedence](#); fixed oscillators with means for selecting among various phases [H03L 7/0814](#))}
- 7/0992 . . . . . {comprising a counter or a frequency divider}
- 7/0993 . . . . . {and a circuit for adding and deleting pulses}
- 7/0994 . . . . . {comprising an accumulator}
- 7/0995 . . . . {the oscillator comprising a ring oscillator}
- 7/0996 . . . . {Selecting a signal among the plurality of phase-shifted signals produced by the ring oscillator}
- 7/0997 . . . . . {Controlling the number of delay elements connected in series in the ring oscillator}
- 7/0998 . . . . . {using phase interpolation}
- 7/10 . . . . for assuring initial synchronisation or for broadening the capture range
- 7/101 . . . . {using an additional control signal to the controlled loop oscillator derived from a signal generated in the loop ([H03L 7/113, H03L 7/187 take precedence](#))}
- 7/102 . . . . . {the additional signal being directly applied to the controlled loop oscillator}
- 7/103 . . . . . {the additional signal being a digital signal}
- 7/104 . . . . {using an additional signal from outside the loop for setting or controlling a parameter in the loop ([H03L 7/107, H03L 7/12 take precedence](#))}
- 7/105 . . . . {Resetting the controlled oscillator when its frequency is outside a predetermined limit}
- 7/107 . . . . using a variable transfer function for the loop, e.g. low pass filter having a variable bandwidth
- 7/1072 . . . . . {by changing characteristics of the charge pump, e.g. changing the gain}
- 7/1075 . . . . . {by changing characteristics of the loop filter, e.g. changing the gain, changing the bandwidth ([H03L 7/1072 takes precedence](#))}
- 7/1077 . . . . . {by changing characteristics of the phase or frequency detection means ([H03L 7/1072 takes precedence](#))}
- 7/113 . . . . using frequency discriminator
- 7/12 . . . . using a scanning signal
- 7/14 . . . . for assuring constant frequency when supply or correction voltages fail
- 7/141 . . . . {the phase-locked loop controlling several oscillators in turn}
- 7/143 . . . . {by switching the reference signal of the phase-locked loop}
- 7/145 . . . . . {the switched reference signal being derived from the controlled oscillator output signal}
- 7/146 . . . . {by using digital means for generating the oscillator control signal ([H03L 7/141, H03L 7/143 take precedence](#))}
- 7/148 . . . . . {said digital means comprising a counter or a divider}
- 7/16 . . Indirect frequency synthesis, i.e. generating a desired one of a number of predetermined frequencies using a frequency- or phase-locked loop
- 7/18 . . . . using a frequency divider or counter in the loop ([H03L 7/20, H03L 7/22 take precedence](#))
- 7/1803 . . . . {the counter or frequency divider being connected to a cycle or pulse swallowing circuit}
- 7/1806 . . . . {the frequency divider comprising a phase accumulator generating the frequency divided signal}
- 7/181 . . . . a numerical count result being used for locking the loop, the counter counting during fixed time intervals ([H03L 7/1806 takes precedence](#))}
- 7/183 . . . . a time difference being used for locking the loop, the counter counting between fixed numbers or the frequency divider dividing by a fixed number ([H03L 7/1806 takes precedence](#))}
- 7/185 . . . . . using a mixer in the loop ([H03L 7/187 - H03L 7/195 take precedence](#))
- 7/187 . . . . . using means for coarse tuning the voltage controlled oscillator of the loop ([H03L 7/191 - H03L 7/195 take precedence](#))
- 7/189 . . . . . comprising a D/A converter for generating a coarse tuning voltage
- 7/191 . . . . . using at least two different signals from the frequency divider or the counter for determining the time difference ([H03L 7/193, H03L 7/195 take precedence](#))
- 7/193 . . . . . the frequency divider/counter comprising a commutable pre-divider, e.g. a two modulus divider
- 7/195 . . . . . in which the counter of the loop counts between two different non zero numbers, e.g. for generating an offset frequency ([H03L 7/193 takes precedence](#))
- 7/197 . . . . a time difference being used for locking the loop, the counter counting between numbers which are variable in time or the frequency divider dividing by a factor variable in time, e.g. for obtaining fractional frequency division ([H03L 7/1806 takes precedence](#))}
- 7/1972 . . . . . {for reducing the locking time interval ([H03L 7/1974, H03L 7/199 take precedence](#))}

## H03L

- 7/1974 . . . . . {for fractional frequency division}
- 7/1976 . . . . . {using a phase accumulator for controlling the counter or frequency divider}
- 7/1978 . . . . . {using a cycle or pulse removing circuit}
- 7/199 . . . . . with reset of the frequency divider or the counter, e.g. for assuring initial synchronisation
- 7/20 . . . using a harmonic phase-locked loop, i.e. a loop which can be locked to one of a number of harmonically related frequencies applied to it  
(H03L 7/22 takes precedence)
- 7/22 . . . using more than one loop
- 7/23 . . . . with pulse counters or frequency dividers
- 7/235 . . . . . {Nested phase locked loops}
- 7/24 . . . using a reference signal directly applied to the generator
- 7/26 . . . using energy levels of molecules, atoms, or subatomic particles as a frequency reference

### 9/00 Automatic control not provided for in other groups of this subclass

#### 2207/00 Indexing scheme relating to automatic control of frequency or phase and to synchronisation

- 2207/04 . . . Modifications for maintaining constant the phase-locked loop damping factor when other loop parameters change
- 2207/05 . . . Compensating for non-linear characteristics of the controlled oscillator
- 2207/06 . . . Phase locked loops with a controlled oscillator having at least two frequency control terminals
- 2207/08 . . . Modifications of the phase-locked loop for ensuring constant frequency when the power supply fails or is interrupted, e.g. for saving power
- 2207/10 . . . Indirect frequency synthesis using a frequency multiplier in the phase-locked loop or in the reference signal path
- 2207/12 . . . Indirect frequency synthesis using a mixer in the phase-locked loop
- 2207/14 . . . Preventing false-lock or pseudo-lock of the PLL
- 2207/18 . . . Temporarily disabling, deactivating or stopping the frequency counter or divider
- 2207/50 . . . All digital phase-locked loop