

**ECLA****EUROPEAN CLASSIFICATION****H03B**

**GENERATION OF OSCILLATIONS, DIRECTLY OR BY FREQUENCY-CHANGING, BY CIRCUITS EMPLOYING ACTIVE ELEMENTS WHICH OPERATE IN A NON-SWITCHING MANNER; GENERATION OF NOISE BY SUCH CIRCUITS** (measuring, testing [G01R](#); generators adapted for electrophonic musical instruments [G10H](#); Speech synthesis [G10L](#); masers, lasers [H01S](#); dynamo-electric machines [H02K](#); power inverter circuits [H02M](#); by using pulse techniques [H03K](#); automatic control of generators [H03L](#); starting, synchronisation or stabilisation of generators where the type of generator is irrelevant or unspecified [H03L](#); generation of oscillations in plasma [H05H](#))

**H03B1/00****Details**[H03B1/02](#)

- Structural details of power oscillators, e.g. for heating [**N**: (construction of transmitters [H04B](#); features of generators for heating by electromagnetic fields [H05B 6/00](#))]

[H03B1/04](#)

- Reducing undesired oscillations, e.g. harmonics

**H03B5/00**

**Generation of oscillations using amplifier with regenerative feedback from output to input** ([H03B9/00](#), [H03B15/00](#) take precedence)

[H03B5/02](#)

- Details

[H03B5/04](#)

- Modifications of generator to compensate for variations in physical values, e.g. power supply, load, temperature

[H03B5/06](#)

- Modifications of generator to ensure starting of oscillations

[H03B5/08](#)

- with frequency-determining element comprising lumped inductance and capacitance

[H03B5/10](#)

- active element in amplifier being vacuum tube ([H03B5/14](#) takes precedence)

[H03B5/12](#)

- active element in amplifier being semiconductor device ([H03B5/14](#) takes precedence)

**[N: WARNING**

**[N1208]** Subgroups [H03B5/12A](#) to [H03B5/12G](#) are incomplete pending reclassification; see also the other subgroups of [H03B5/12](#) ]

[H03B5/12A](#)

- [N: the amplifier being a single transistor] [C1207]

[H03B5/12B](#)

- [N: using multiple transistors for amplification] [C1207]

[H03B5/12B1](#)

- [N: the amplifier having two current paths operating in a differential manner and a current source or degeneration circuit in common to both paths e.g. a long-tailed pair. ([H03B5/12B2A](#) takes precedence) ] [N1204]

[H03B5/12B2](#)

- [N: the amplifier comprising a pair of transistors, wherein an output terminal of each being connected to an input terminal of the other, e.g. a cross coupled pair] [N1204]

[H03B5/12B2A](#)

- [N: the current source or degeneration circuit being in common to both transistors of the pair, e.g. a cross-coupled long-tailed pair] [N1204]

[H03B5/12B3](#)

- [N: the generator being of the balanced type] [N1204]

H03B5/12B4	. . . .	[N: the amplifier comprising multiple amplification stages connected in cascade] [N1204]
H03B5/12B5	. . . .	[N: the generator comprising multiple amplifiers connected in parallel] [N1204]
H03B5/12C	. . .	[N: the amplifier comprising one or more field effect transistors] [C1207]
H03B5/12D	. . .	[N: the amplifier comprising one or more bipolar transistors] [N9909] [C1207]
H03B5/12E	. . .	[N: and comprising means for varying the output amplitude of the generator ( <a href="#">H03B5/12F5A</a> takes precedence)] [N9909] [C1207]
H03B5/12F	. . .	[N: comprising means for varying the frequency of the generator] [N1204]
H03B5/12F1	. . . .	[N: the means comprising a voltage dependent capacitance] [N1204]
H03B5/12F1A	. . . . .	[N: the means comprising voltage variable capacitance diodes] [N1204]
H03B5/12F1B	. . . . .	[N: the means comprising transistors used to provide a variable capacitance] [N1204]
H03B5/12F1B1	. . . . .	[N: the transistors being bipolar transistors] [N1204]
H03B5/12F1B2	. . . . .	[N: the transistors being field-effect transistors] [N1204]
H03B5/12F2	. . . .	[N: the means comprising a variable inductance] [N1204]
H03B5/12F2A	. . . . .	[N: the means comprising a variable active inductor e.g. gyrator circuits] [N1204]
H03B5/12F3	. . . .	[N: the means comprising switched elements] [N1204]
H03B5/12F3A	. . . . .	[N: switched capacitors] [N1204]
H03B5/12F3B	. . . . .	[N: switched inductors] [N1204]
H03B5/12F4	. . . .	[N: the frequency being controlled by a control current i.e. current controlled oscillators] [N1204]
H03B5/12F5	. . . .	[N: having further means for varying a parameter in dependence on the frequency] [N1204]
H03B5/12F5A	. . . . .	[N: the parameter being an amplitude of a signal, e.g. maintaining a constant output amplitude over the frequency range] [N1204]
H03B5/12F5B	. . . . .	[N: the parameter being the amount of feedback] [N1204]
H03B5/12F5C	. . . . .	[N: the parameter being another frequency, e.g. a harmonic of the oscillating frequency] [N1204]
H03B5/12F5D	. . . . .	[N: the parameter being a quality factor, e.g. Q factor of the frequency determining element] [N1204]
H03B5/12F5E	. . . . .	[N: the parameter being a bias voltage or a power supply] [N1204]
H03B5/12F6	. . . .	[N: having means for achieving a desired tuning characteristic e.g. linearising the frequency characteristic across the tuning voltage range ] [N1204]
H03B5/12G	. . .	[N: the feedback circuit comprising a transformer] [N1204]
H03B5/14	. .	frequency-determining element connected via bridge circuit to closed ring around which signal is transmitted
H03B5/16	. . .	active element in amplifier being vacuum tube
H03B5/18	. .	with frequency-determining element comprising distributed inductance and capacitance
H03B5/18D	. .	[N: the frequency-determining element being a coaxial resonator] [N9410]
H03B5/18D2	. . .	[N: the active element in the amplifier being a vacuum tube (see provisionally also <a href="#">H03B5/18E2</a> )] [N9410]
H03B5/18E	. .	[N: the frequency-determining element being a cavity resonator] [N9410]
H03B5/18E1	. . .	[N: the active element in the amplifier being a semiconductor device] [N9410]

H03B5/18E1B	. . . . [N: the semiconductor device being a field-effect device] [N9410]
H03B5/18E2	. . . . [N: the active element in the amplifier being a vacuum tube] [N9410]
H03B5/18F	. . . [N: the frequency-determining element being a strip line resonator ( <a href="#">H03B5/18D</a> , <a href="#">H03B5/18E</a> , <a href="#">H03B5/18G</a> and <a href="#">H03B5/18H</a> take precedence)] [N9410]
H03B5/18F1	. . . . [N: the active element in the amplifier being a semiconductor device] [N9410]
H03B5/18F1B	. . . . [N: the semiconductor device being a field-effect device] [N9410]
H03B5/18F2	. . . . [N: the active element in the amplifier being a vacuum tube (see provisionally also <a href="#">H03B5/18E2</a> )] [N9410]
H03B5/18G	. . . [N: the frequency-determining element being a dielectric resonator] [N9410]
H03B5/18G1	. . . . [N: the active element in the amplifier being a semiconductor device] [N9410]
H03B5/18G1B	. . . . [N: the semiconductor device being a field-effect device] [N9410]
H03B5/18H	. . . [N: the frequency-determining element being a magnetic-field sensitive resonator, e.g. a Yttrium Iron Garnet or a magnetostatic surface wave resonator] [N9410]
H03B5/18H1	. . . . [N: the active element in the amplifier being a semiconductor device] [N9410]
H03B5/18H1B	. . . . [N: the semiconductor device being a field-effect device] [N9410]
H03B5/20	. with frequency-determining element comprising resistance and either capacitance or inductance, e.g. phase-shift oscillator
H03B5/22	. . active element in amplifier being vacuum tube ( <a href="#">H03B5/26</a> takes precedence)
H03B5/24	. . active element in amplifier being semiconductor device ( <a href="#">H03B5/26</a> takes precedence)
H03B5/26	. . frequency-determining element being part of bridge circuit in closed ring around which signal is transmitted; frequency-determining element being connected via a bridge circuit to such a closed ring, e.g. Wien-Bridge oscillator, parallel-T oscillator
H03B5/28	. . . active element in amplifier being vacuum tube
H03B5/30	. with frequency-determining element being electromechanical resonator
H03B5/32	. . being a piezo-electric resonator (selection of piezo-electric material <a href="#">H01L41/00</a> )
H03B5/32A	. . . [N: the resonator having more than two terminals ( <a href="#">H03B5/32B</a> takes precedence)]
H03B5/32B	. . . [N: the resonator being an acoustic wave device, e.g. SAW or BAW device]
H03B5/34	. . . active element in amplifier being vacuum tube ( <a href="#">H03B5/38</a> takes precedence)
H03B5/36	. . . active element in amplifier being semiconductor device ([N: <a href="#">H03B5/32A</a> , <a href="#">H03B5/32B</a> ], <a href="#">H03B5/38</a> take precedence)
H03B5/36A	. . . . [N: the amplifier being a single transistor ( <a href="#">H03B5/36B</a> to <a href="#">H03B5/36C1</a> take precedence)]
H03B5/36B	. . . . [N: the amplifier comprising field effect transistors ( <a href="#">H03B5/36C</a> takes precedence)]
H03B5/36C	. . . . [N: and comprising means for varying the frequency by a variable voltage or current]
H03B5/36C1	. . . . . [N: the means being voltage variable capacitance diodes]
H03B5/38	. . . frequency-determining element being connected via bridge circuit to closed ring around which signal is transmitted
H03B5/40	. . being a magnetostrictive resonator ( <a href="#">H03B5/42</a> takes precedence; selection of magneto-strictive material [N: <a href="#">H01F1/00</a> ]; <a href="#">H01L41/00</a> )
H03B5/42	. . frequency-determining element connected via bridge circuit to closed ring around which signal is transmitted

- H03B7/00**      **Generation of oscillations using active element having a negative resistance between two of its electrodes ([H03B9/00](#) takes precedence)**
- [H03B7/02](#)      . with frequency-determining element comprising lumped inductance and capacitance
  - [H03B7/04](#)      . . active element being vacuum tube
  - [H03B7/06](#)      . . active element being semiconductor device
  - [H03B7/08](#)      . . . being a tunnel diode
  - [H03B7/10](#)      . . active element being gas-discharge or arc-discharge tube
  - [H03B7/12](#)      . with frequency-determining element comprising distributed inductance and capacitance
  - [H03B7/14](#)      . . active element being semiconductor device
  - [H03B7/14B](#)      . . . [N: and which comprises an element depending on a voltage or a magnetic field, e.g. varactor- YIG]
  - [H03B7/14D](#)      . . . [N: with several semiconductor devices]
- H03B9/00**      **Generation of oscillations using transit-time effects [N: (construction of tube and circuit arrangements not adapted to a particular application [H01J](#); construction of the semiconductor devices [H01L](#))]**
- [H03B9/01](#)      . using discharge tubes
  - [H03B9/02](#)      . . using a retarding-field tube ([using klystrons \[H03B9/04\]\(#\)](#))
  - [H03B9/04](#)      . . using a klystron
  - [H03B9/06](#)      . . . using a reflex klystron
  - [H03B9/08](#)      . . using a travelling-wave tube
  - [H03B9/10](#)      . . using a magnetron
  - [H03B9/12](#)      . using solid state devices, e.g. Gunn-effect devices
  - [H03B9/14](#)      . . and elements comprising distributed inductance and capacitance
  - [H03B9/14B](#)      . . . [N: and comprising a voltage sensitive element, e.g. varactor]
  - [H03B9/14C](#)      . . . [N: and comprising a magnetic field sensitive element, e.g. YIG]
  - [H03B9/14D](#)      . . . [N: using more than one solid state device]
  - [H03B9/14E](#)      . . . [N: the frequency being determined by a cavity resonator, e.g. a hollow waveguide cavity or a coaxial cavity ([H03B9/14B to H03B9/14D](#), [H03B9/14F](#), [H03B9/14G](#) take precedence)] [N9909]
  - [H03B9/14E1](#)      . . . . [N: formed by a disc, e.g. a waveguide cap resonator] [N9909]
  - [H03B9/14F](#)      . . . [N: the frequency being determined by a stripline resonator ([H03B9/14B to H03B9/14D](#), [H03B9/14G](#) take precedence)] [N9909]
  - [H03B9/14G](#)      . . . [N: the frequency being determined by a dielectric resonator ([H03B9/14B to H03B9/14D](#) take precedence)] [N9909]
- H03B11/00**      **Generation of oscillations using a shock-excited tuned circuit ([with feedback \[H03B5/00\]\(#\)](#))**
- [H03B11/02](#)      . excited by spark ([spark gaps therefor \[H01T9/00\]\(#\)](#))

- H03B11/04 . excited by interrupter
- H03B11/06 . . by mechanical interrupter
- H03B11/08 . . interrupter being discharge tube
- H03B11/10 . . interrupter being semiconductor device
  
- H03B13/00** **Generation of oscillations using deflection of electron beam in a cathode-ray tube**
  
- H03B15/00** **Generation of oscillations using galvano-magnetic devices, e.g. Hall-effect devices, or using super-conductivity effects ([galvano-magnetic devices per se H01L43/00](#))**
  
- H03B15/00A . [N: using superconductivity effects ([devices using superconductivity H01L39/00](#))] [N1112]
- H03B15/00B . [N: using spin transfer effects or giant magnetoresistance] [N1112]
  
- H03B17/00** **Generation of oscillations using radiation source and detector, e.g. with interposed variable obturator**
  
- H03B19/00** **Generation of oscillations by non-regenerative frequency multiplication or division of a signal from a separate source ([transference of modulation from one carrier to another H03D7/00](#))**
  
- H03B19/03 . using non-linear inductance
- H03B19/05 . using non-linear capacitance, e.g. varactor diodes
- H03B19/06 . by means of discharge device or semiconductor device with more than two electrodes
- H03B19/08 . . by means of a discharge device
- H03B19/10 . . . using multiplication only
- H03B19/12 . . . using division only
- H03B19/14 . . by means of a semiconductor device
  
- H03B19/16 . using uncontrolled rectifying devices, e.g. rectifying diodes or Schottky diodes
- H03B19/18 . . and elements comprising distributed inductance and capacitance
- H03B19/20 . . being diodes exhibiting charge storage or enhancement effects
  
- H03B21/00** **Generation of oscillations by combining unmodulated signals of different frequencies ([H03B19/00](#) takes precedence; frequency changing circuits in general [H03D](#))**
  
- H03B21/01 . by beating unmodulated signals of different frequencies
- H03B21/02 . . by plural beating, i.e. for frequency synthesis; [N: [Beating in combination with multiplication or division of frequency \(digital frequency synthesis using a ROM G06F1/02; digital frequency synthesis in general H03K; indirect frequency synthesis using a PLL H03L7/16\)](#)]
- H03B21/02F . . . [N: [by repeated mixing in combination with division of frequency only](#)]

- H03B21/04 . . . using several similar stages
  
- H03B23/00** **Generation of oscillations periodically swept over a predetermined frequency range** ([angle-modulating circuits in general](#) [H03C3/00](#))
  
- H03B25/00** **Simultaneous generation by a free-running oscillator of oscillations having different frequencies**
  
- H03B27/00** **Generation of oscillations providing a plurality of outputs of the same frequency but differing in phase, other than merely two anti-phase outputs**
  
- H03B28/00** **Generation of oscillations by methods not covered by groups [H03B5/00](#) to [H03B27/00](#), including modification of the waveform to produce sinusoidal oscillations** ([analogue function generators for performing computing operations](#) [G06G7/26](#); [use of transformers for conversion of waveform in ac-ac converters](#) [H02M5/18](#))
  
- H03B29/00** **Generation of noise currents and voltages** [**N: (gasfilled discharge tubes with solid cathode specially adapted as noise generators** [H01J17/00B](#))]