

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](#)
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- [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 (H03B5/12F5A 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 H03B5/18E2)] [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 ([H03B5/18D](#), [H03B5/18E](#), [H03B5/18G](#) and [H03B5/18H](#) 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 H03B5/18E2](#))] [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 ([H03B5/26](#) takes precedence)
- H03B5/24 . . . active element in amplifier being semiconductor device ([H03B5/26](#) 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 H01L41/00](#))
- H03B5/32A [N: the resonator having more than two terminals ([H03B5/32B](#) 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 ([H03B5/38](#) takes precedence)
- H03B5/36 active element in amplifier being semiconductor device ([N: [H03B5/32A](#), [H03B5/32B](#)], [H03B5/38](#) take precedence)
- H03B5/36A [N: the amplifier being a single transistor ([H03B5/36B](#) to [H03B5/36C1](#) take precedence)]
- H03B5/36B [N: the amplifier comprising field effect transistors ([H03B5/36C](#) 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 ([H03B5/42](#) takes precedence; [selection of magneto-strictive material \[N: H01F1/00\]; H01L41/00](#))
- 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](#))**]