

**CPC****COOPERATIVE PATENT CLASSIFICATION****H03J****TUNING RESONANT CIRCUITS; SELECTING RESONANT CIRCUITS**

(indicating arrangements for measuring [G01D](#) ; measuring, testing [G01R](#) ; remote-control in general [G05](#) , [G08](#) ; automatic control or stabilisation of generators [H03L](#) )

**NOTE**

This subclass covers also the control of tuning, including the combined control of tuning and other functions, e.g. combinations of tuning control and volume control, combinations of control of local oscillator and of supplementary resonant circuits.

**Guidance heading:****H03J 1/00**

**Details of adjusting, driving, indicating, or mechanical control arrangements for resonant circuits in general** (machine elements in general [F16](#) ; coupling of knobs to shafts [F16D](#) )

- H03J 1/0008 . {using a central processing unit, e.g. a microprocessor (digital tuning in general [H03J 5/0245](#)) }
- H03J 1/0016 . . {Indicating arrangements (digital indication of tuning in general [H03J 1/048](#)) }
- H03J 1/0025 . . {in a remote control unit (remote control tuning in general [H03J 9/00](#)) }
- H03J 1/0033 . . {for voltage synthesis with a D/A converter }
- H03J 1/0041 . . {for frequency synthesis with counters or frequency dividers }
- H03J 1/005 . . . {in a loop }
- H03J 1/0058 . . { provided with channel identification means (arrangements for monitoring the use made of broadcast services [H04H 60/31](#)) }
- H03J 1/0066 . . . {with means for analysing the received signal strength ([H03J 1/0083](#) takes precedence) }
- H03J 1/0075 . . . . {where the receiving frequencies of the stations are stored in a permanent memory, e.g. ROM }
- H03J 1/0083 . . . {using two or more tuners }
- H03J 1/0091 . . {provided with means for scanning over a band of frequencies ([H03J 1/0058](#) takes precedence) }
- H03J 1/02 . Indicating arrangements { (indicating correct tuning [H03J 3/12](#)) }
- H03J 1/025 . . {with voiced announcement }
- H03J 1/04 . . with optical indicating means
- H03J 1/041 . . . {Pointers, markers, or the like, for tuning dials; Folding dials }
- H03J 1/042 . . . {Means insuring a precise reading of the dial, e.g. special scale, local illumination possibly temporary, luminous point moving with the pointer }
- H03J 1/044 . . . {Illumination of the tuning dial; On and off switching of the illumination; Circuits related with illumination }
- H03J 1/045 . . . {Indication of the tuning band, the bandwidth, tone control, the channel number, the frequency, or the like }
- H03J 1/047 . . . . {using electronic means, e.g. LED's (display of electronic variables in

- general [G01R 13/00](#), for discontinuous display [G01R 13/404](#) }
- H03J 1/048 . . . . . {with digital indication (using a microprocessor [H03J 1/0016](#)) }
- H03J 1/06 . Driving or adjusting arrangements; combined with other driving or adjusting arrangements, e.g. of gain control
- H03J 1/063 . . {Special arrangements taken in correlation with the wear; Suppressing backlash; Locking in a desired position }
- H03J 1/066 . . {Constructional details regarding potentiometric setting of voltage or current variable reactances }
- NOTE**
- Groups [H03J 1/14](#), [H03J 1/16](#) take precedence over groups [H03J 1/08](#) to [H03J 1/12](#).
- H03J 1/08 . . Toothed-gear drive; Worm drive
- H03J 1/10 . . Rope drive; Chain drive
- H03J 1/12 . . Friction drive
- H03J 1/14 . . Special arrangements for fine and coarse tuning
- H03J 1/16 . . Single control means independently performing two or more functions
- H03J 1/18 . Control by auxiliary power
- H03J 1/182 . . {using a ring of magnets or the like }
- H03J 1/185 . . {the auxiliary power producing an adjustment dependent on the current intensity }
- H03J 1/187 . . {the auxiliary power balancing automatically a Wheatstone bridge or the like, that has been unbalanced by the controlling device }
- H03J 1/20 . . the auxiliary power being switched on as long as controlling current is switched on
- H03J 1/22 . . with stepping arrangements actuated by control pulses
- H03J 3/00** **Continuous tuning** ([H03J 7/00](#), [H03J 9/00](#) take precedence; combination of continuous and discontinuous tuning other than for bandspreading [H03J 5/00](#))
- H03J 3/02 . Details
- H03J 3/04 . . Arrangements for compensating for variations of physical values, e.g. temperature (automatic control of ambient conditions [G05D](#) )
- H03J 3/06 . . Arrangements for obtaining constant bandwidth or gain throughout tuning range or ranges (automatic gain control [H03G](#) )
- H03J 3/08 . . . by varying a second parameter simultaneously with the tuning, e.g. coupling bandpass filter
- H03J 3/10 . . Circuit arrangements for fine tuning, e.g. bandspreading
- H03J 3/12 . . Electrically-operated arrangements for indicating correct tuning
- H03J 3/14 . . . Visual indication, e.g. magic eye
- H03J 3/16 . . Tuning without displacement of reactive element, e.g. by varying permeability
- H03J 3/18 . . . by discharge tube or semiconductor device simulating variable reactance
- H03J 3/185 . . . {with varactors, i.e. voltage variable reactive diodes }
- H03J 3/20 . of single resonant circuit by varying inductance only or capacitance only
- H03J 3/22 . of single resonant circuit by varying inductance and capacitance simultaneously

- H03J 3/24 . of more than one resonant circuit simultaneously, the circuits being tuned to substantially the same frequency, e.g. for single-knob tuning
- H03J 3/26 . . the circuits being coupled so as to form a bandpass filter
- H03J 3/28 . of more than one resonant circuit simultaneously, the tuning frequencies of the circuits having a substantially constant difference throughout the tuning range
- H03J 3/30 . . Arrangements for ensuring tracking with variable inductors
- H03J 3/32 . . Arrangements for ensuring tracking with variable capacitors
- H03J 5/00** **Discontinuous tuning; Selecting predetermined frequencies; Selecting frequency bands with or without continuous tuning in one or more of the bands, e.g. push-button tuning, turret tuner ([H03J 7/00](#), [H03J 9/00](#) take precedence; for bandspreading [H03J 3/10](#))**
- H03J 5/02 . with variable tuning element having a number of predetermined settings and adjustable to a desired one of these settings
- H03J 5/0209 . . {Discontinuous tuning using an electrical variable impedance element, e.g. a voltage variable reactive diode, by selecting the corresponding analogue value between a set of non preset values }
- H03J 5/0218 . . {Discontinuous tuning using an electrical variable impedance element, e.g. a voltage variable reactive diode, by selecting the corresponding analogue value between a set of preset values }
- H03J 5/0227 . . . {using a counter }
- H03J 5/0236 . . . {with possibility to skip over certain counter positions, i.e. channel skipping, or scanning the counter position with a variable frequency rate }
- H03J 5/0245 . . {Discontinuous tuning using an electrical variable impedance element, e.g. a voltage variable reactive diode, in which no corresponding analogue value either exists or is preset, i.e. the tuning information is only available in a digital form ([microprocessor tuning \[H03J 1/0008\]\(#\)](#)) }
- H03J 5/0254 . . . {the digital values being transferred to a D/A converter }
- H03J 5/0263 . . . . {the digital values being held in an auxiliary non erasable memory }
- H03J 5/0272 . . . {the digital values being used to preset a counter or a frequency divider in a phase locked loop, e.g. frequency synthesizer }
- H03J 5/0281 . . . . {the digital values being held in an auxiliary non erasable memory }
- H03J 5/029 . . . {with channel skipping capability }
- H03J 5/04 . . operated by hand
- H03J 5/06 . . . Settings determined by single indexing means with snap action
- H03J 5/08 . . . Settings determined by a number of separately-actuated positioning means
- H03J 5/10 . . . Settings determined by a number of positioning means mounted on a common support, e.g. turret tuner, which is adjustable to desired positions, a different positioning means being in operation in each position
- H03J 5/12 . . . Settings determined by a number of separately-actuated driving means which adjust the tuning element directly to desired settings
- H03J 5/14 . . operated by auxiliary power
- H03J 5/143 . . . {Settings determined by a number of positioning means mounted on a common support, e.g. turret tuner, which is adjustable to determined positions, a different positioning means being in operation in each position }
- H03J 5/146 . . . {Settings desired by a switch controlled together with the tuning member and

- which stops the control as soon as a desired position is reached }
- H03J 5/16 . . . Settings determined by a number of separate positioning means actuated by hand
- H03J 5/18 . . . Settings determined by a number of separate positioning means actuated by electromagnets
- H03J 5/20 . . . Settings determined by a number of positioning means actuated by a second means adjustable to different positions by the same or by a second auxiliary power
- H03J 5/22 . . . Settings determined by a number of separately actuated driving means which adjust the tuning element directly to desired settings
- H03J 5/24 . with a number of separate pretuned tuning circuits or separate tuning elements selectively brought into circuit, e.g. for waveband selection, for television channel selection ([switches in general H01H](#) )
- H03J 5/242 . . {used exclusively for band selection }
- H03J 5/244 . . . {using electronic means }
- H03J 5/246 . . {using electronic means ([H03J 5/244 takes precedence](#)) }
- H03J 5/248 . . {using electromechanical means }
- H03J 5/26 . . operated by hand
- H03J 5/28 . . . Tuning circuits or elements supported on a revolving member with contacts arranged in a plane perpendicular to the axis
- H03J 5/30 . . . Tuning circuits or elements supported on a revolving member with contacts arranged in lines parallel to the axis
- H03J 5/32 . . . Stationary tuning circuits or elements selected by push-button
- H03J 7/00 Automatic frequency control; Automatic scanning over a band of frequencies**
- H03J 7/02 . Automatic frequency control ([H03J 7/18 takes precedence](#); automatic tuning control for television receivers [H04N 5/50](#))
- H03J 7/023 . . {Neutralization of the automatic frequency correction during a tuning change }
- H03J 7/026 . . {Means preventing a wrong working of the automatic frequency correction in case of fading or bad signal/noise ratio }
- H03J 7/04 . . where the frequency control is accomplished by varying the electrical characteristics of a non-mechanically adjustable element or where the nature of the frequency controlling element is not significant
- H03J 7/042 . . . {with reactance tube }
- H03J 7/045 . . . {Modification of automatic frequency control sensitivity or linearising automatic frequency control operation; Modification of the working range ([H03J 7/10 takes precedence](#)) }
- H03J 7/047 . . . {Automatic frequency control using an auxiliary signal, e.g. low frequency scanning of the locking range or superimposing a special signal on the input signal }
- H03J 7/06 . . . using counters or frequency dividers
- H03J 7/065 . . . . {the counter or frequency divider being used in a phase locked loop }
- H03J 7/08 . . . using varactors, i.e. voltage variable reactive diodes ([H03J 7/06 takes precedence](#))
- H03J 7/10 . . . . Modification of automatic frequency control sensitivity or linearising automatic frequency control operation

- H03J 7/12 . . . . Combination of automatic frequency control voltage with stabilised varactor supply voltage
- H03J 7/14 . . . Controlling the magnetic state of inductor cores ([H03J 7/06 takes precedence](#))
- H03J 7/16 . . where the frequency control is accomplished by mechanical means, e.g. by a motor
  
- H03J 7/18 . Automatic scanning over a band of frequencies
- H03J 7/183 . . {combined with selection between different stations transmitting the same programm, e.g. by analysis of the received signal strength }
- H03J 7/186 . . . {using two or more tuners }
- H03J 7/20 . . where the scanning is accomplished by varying the electrical characteristics of a non-mechanically adjustable element { ([H03J 7/183 takes precedence](#)) }
- H03J 7/22 . . . in which an automatic frequency control circuit is brought into action after the scanning action has been stopped ([H03J 7/24 takes precedence](#))
- H03J 7/24 . . . using varactors, i.e. voltage variable reactive diodes ([H03J 7/28 takes precedence](#))
- H03J 7/26 . . . . in which an automatic frequency control circuit is brought into action after the scanning action has been stopped
- H03J 7/28 . . . using counters or frequency dividers
- H03J 7/285 . . . . {the counter or frequency divider being used in a phase locked loop }
- H03J 7/30 . . where the scanning is accomplished by mechanical means, e.g. by a motor
- H03J 7/305 . . . {in which an automatic frequency control circuit is brought in action after the scanning action has been stopped }
- H03J 7/32 . . with simultaneous display of received frequencies, e.g. panoramic receivers
  
- H03J 9/00 Remote-control of tuned circuits; Combined remote-control of tuning and other functions, e.g. brightness, amplification ([mechanical remote-control arrangements H03J 1/00](#); {using a microprocessor [H03J 1/0025](#); constructional details of remote control switching devices [H01H 9/0235](#) })**
  
- H03J 9/002 . {comprising one or more tuning stages separated from the rest of a receiver }
- H03J 9/005 . {using non-electrical means without push-button control, e.g. pneumatic, hydraulic or sound wave transmission, Bowden cables }
- H03J 9/007 . {by voltages or currents with different frequencies or phases }
- H03J 9/02 . using radio transmission; using near-field transmission
- H03J 9/04 . using ultrasonic, sonic or infrasonic waves
- H03J 9/06 . using electromagnetic waves other than radio waves, e.g. light

#### Guidance heading:

- H03J 2200/00 Indexing scheme relating to tuning resonant circuits and selecting resonant circuits**
- H03J 2200/01 . Circuitry controlling the selecting or switching action

- H03J 2200/02 . Algorithm used as input for AFC action alignment receiver
- H03J 2200/03 . Alignment of a receiver during fabrication
- H03J 2200/04 . Alignment of a transmitter during fabrication
- H03J 2200/05 . Alignment of transmitter with a receiver, after fabrication
- H03J 2200/06 . Tuning of antenna
- H03J 2200/07 . Calibration of receivers, using quartz crystal oscillators as reference
- H03J 2200/08 . Calibration of receivers, in particular of a band pass filter
- H03J 2200/09 . Calibration of oscillator in receiver, using an external carrier frequency as reference
- H03J 2200/10 . Tuning of a resonator by means of digitally controlled capacitor bank
- H03J 2200/11 . Cellular receiver, e.g. GSM, combined with a GPS receiver
- H03J 2200/12 . Radio receiver combined with a GPS receiver
- H03J 2200/13 . Television receiver combined with a GPS receiver
- H03J 2200/14 . Tunable filter in receiver contributing to image rejection
- H03J 2200/15 . Tuning of resonator by means of digitally controlled inductor bank
- H03J 2200/16 . Interpolation of control values for varicaps
- H03J 2200/17 . Elimination of interference caused by harmonics of local oscillator
- H03J 2200/18 . Tuning of a master filter in order to tune its slave filter
- H03J 2200/19 . Resonator in MEMS technology
- H03J 2200/20 . Radio receiver with possibility to choose a station with a certain program style
- H03J 2200/21 . Television receiver with possibility to choose a station with a certain program style
- H03J 2200/22 . Remote control device controlling cursor and/or including a cursor detecting device
- H03J 2200/23 . Remote control device with display showing data to be transmitted to the controlled apparatus
- H03J 2200/24 . Remote control device with display showing program content
- H03J 2200/25 . Remote control device with display
- H03J 2200/26 . . Remote control device with touch screen display
- H03J 2200/27 . Adjusting the seek sensitivity of a scanning or sweeping receiver

- H03J 2200/28 . Automatic self-alignment of a receiver
- H03J 2200/29 . Self-calibration of a receiver
- H03J 2200/30 . Radio receiver with speech synthesis ability, used for conveying information that is shown on the display
- H03J 2200/31 . Several sweeping or scanning speeds
- H03J 2200/32 . Tuning of tracking filter
- H03J 2200/33 . Tuning of filter by controlling transconductance
- H03J 2200/34 . Tuning of oscillator by controlling transconductance
- H03J 2200/35 . Inductance tunable by switching in/out parts of the inductor
- H03J 2200/36 . Circuit arrangements for e.g. increasing the tuning range, linearizing the voltage-capacitance relationship, lowering noise, constant slope in different bands
- H03J 2200/37 . Control voltage applied to the anode of the varicap
- H03J 2200/38 . Control voltage applied to the cathode of the varicap
- H03J 2200/39 . Variable capacitors implemented using micro electro-mechanical systems [MEMS]
- H03J 2200/40 . Conversion to a zero or near-zero intermediate frequency