

CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H03 ELECTRONIC CIRCUITRY

H03D DEMODULATION OR TRANSFERENCE OF MODULATION FROM ONE CARRIER TO ANOTHER (masers, lasers [H01S](#); circuits capable of acting both as modulator and demodulator [H03C](#); details applicable to both modulators and frequency-changers [H03C](#); demodulating pulses [H03K 9/00](#); transforming types of pulse modulation [H03K 11/00](#); coding, decoding or code conversion, in general [H03M](#); repeater stations [H04B 7/14](#); demodulators adapted for AC systems of digital information transmission [H04L 27/00](#); synchronous demodulators adapted for colour television [H04N 9/66](#))

NOTE

This subclass covers only:

- demodulation or transference of signals modulated on a sinusoidal carrier or on electromagnetic waves;
- comparing phase or frequency of two mutually-independent oscillations.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

| | | | |
|-------------|---|-------------|--|
| 1/00 | Demodulation of amplitude-modulated oscillations (H03D 5/00 , H03D 9/00 , H03D 11/00 take precedence) | 1/2272 | . . {using FET's (H03D 1/2209 , H03D 1/2245 and H03D 1/2281 take precedence)} |
| 1/02 | . Details | 1/2281 | . . {using a phase locked loop (H03D 1/2236 and H03D 1/2254 take precedence)} |
| 1/04 | . . Modifications of demodulators to reduce interference by undesired signals | 1/229 | . . {using at least a two emitter-coupled differential pair of transistors (H03D 1/2209 - H03D 1/2281 take precedence)} |
| 1/06 | . . Modifications of demodulators to reduce distortion, e.g. by negative feedback | 1/24 | . . for demodulation of signals wherein one sideband or the carrier has been wholly or partially suppressed {(receiver circuits H04B 1/302)} |
| 1/08 | . by means of non-linear two-pole elements (H03D 1/22 , H03D 1/26 , H03D 1/28 take precedence) | 1/26 | . by means of transit-time tubes |
| 1/10 | . . of diodes | 1/28 | . by deflecting an electron beam in a discharge tube (H03D 1/26 takes precedence) |
| 1/12 | . . . with provision for equalising AC and DC loads | 3/00 | Demodulation of angle-, {frequency- or phase-} modulated oscillations (H03D 5/00 , H03D 9/00 , H03D 11/00 take precedence) |
| 1/14 | . by means of non-linear elements having more than two poles (H03D 1/22 , H03D 1/26 , H03D 1/28 take precedence) | 3/001 | . {Details of arrangements applicable to more than one type of frequency demodulator (H03D 3/28 takes precedence)} |
| 1/16 | . . of discharge tubes | 3/002 | . . {Modifications of demodulators to reduce interference by undesired signals (H03D 3/248 takes precedence)} |
| 1/18 | . . of semiconductor devices | 3/003 | . . {Arrangements for reducing frequency deviation, e.g. by negative frequency feedback (combined with a phase locked loop demodulator H03D 3/242 ; changing frequency deviation for modulators H03C 3/06)} |
| 1/20 | . . with provision for preventing undesired type of demodulation, e.g. preventing anode detection in a grid detection circuit | 3/004 | . . . {wherein the demodulated signal is used for controlling an oscillator, e.g. the local oscillator} |
| 1/22 | . Homodyne or synchrodyne circuits {(receiver circuits H04B 1/30)} | 3/005 | . . . {wherein the demodulated signal is used for controlling a bandpass filter (automatic bandwidth control H03G ; automatic frequency control H03J 7/02)} |
| 1/2209 | . . {Decoders for simultaneous demodulation and decoding of signals composed of a sum-signal and a suppressed carrier, amplitude modulated by a difference signal, e.g. stereocoders} | | |
| 1/2218 | . . . {using diodes for the decoding} | | |
| 1/2227 | . . . {using switches for the decoding (diodes used as switches H03D 1/2218)} | | |
| 1/2236 | . . . {using a phase locked loop} | | |
| 1/2245 | . . {using two quadrature channels (H03D 1/2209 takes precedence)} | | |
| 1/2254 | . . . {and a phase locked loop} | | |
| 2001/2263 | {including a counter or a divider in the PLL} | | |

- 3/006 . {by sampling the oscillations and further processing the samples, e.g. by computing techniques ([H03D 3/007](#) takes precedence)}
- 3/007 . {by converting the oscillations into two quadrature related signals ([H03D 3/245](#) takes precedence)}
- 3/008 . . {Compensating DC offsets}
- 3/009 . . {Compensating quadrature phase or amplitude imbalances}
- 3/02 . by detecting phase difference between two signals obtained from input signal ([H03D 3/28](#) - [H03D 3/32](#) take precedence; {muting in frequency-modulation receivers [H03G 3/28](#)}; limiting arrangements [H03G 11/00](#))
- 3/04 . . by counting or integrating cycles of oscillations {{arrangements for measuring frequencies [G01R 23/10](#)}}
- 3/06 . . by combining signals additively or in product demodulators
- 3/08 . . . by means of diodes, e.g. Foster-Seeley discriminator
- 3/10 in which the diodes are simultaneously conducting during the same half period of the signal, e.g. radio detector
- 3/12 . . . by means of discharge tubes having more than two electrodes
- 3/14 . . . by means of semiconductor devices having more than two electrodes
- 3/16 . . . by means of electromechanical resonators
- 3/18 . . by means of synchronous gating arrangements
- 3/20 . . . producing pulses whose amplitude or duration depends on phase difference
- 3/22 . . by means of active elements with more than two electrodes to which two signals are applied derived from the signal to be demodulated and having a phase difference related to the frequency deviation, e.g. phase detector
- 3/24 . . Modifications of demodulators to reject or remove amplitude variations by means of locked-in oscillator circuits
- 3/241 . . . {the oscillator being part of a phase locked loop}
- 3/242 {combined with means for controlling the frequency of a further oscillator, e.g. for negative frequency feedback or AFC}
- 3/244 {combined with means for obtaining automatic gain control}
- 3/245 {using at least twophase detectors in the loop ([H03D 3/244](#) takes precedence; in general [H03L 7/087](#))}
- 3/247 {using a controlled phase shifter (in general [H03L 7/081](#))}
- 3/248 {with means for eliminating interfering signals, e.g. by multiple phase locked loops (multiple loops in general [H03L 7/07](#), [H03L 7/22](#))}
- 3/26 . by means of sloping amplitude/frequency characteristic of tuned or reactive circuit ([H03D 3/28](#) - [H03D 3/32](#) takes precedence)
- 3/28 . Modifications of demodulators to reduce effects of temperature variations ({automatic frequency regulation in receivers [H03J](#)}; automatic frequency control [H03L](#))
- 3/30 . by means of transit-time tubes
- 3/32 . by deflecting an electron beam in a discharge tube ([H03D 3/30](#) takes precedence)
- 3/34 . by means of electromechanical devices ([H03D 3/16](#) takes precedence)
- 5/00** **Circuits for demodulating amplitude-modulated or angle-modulated oscillations at will** ([H03D 9/00](#), [H03D 11/00](#) take precedence)
- 7/00** **Transference of modulation from one carrier to another, e.g. frequency-changing** ([H03D 9/00](#), [H03D 11/00](#) take precedence; dielectric amplifiers, magnetic amplifiers, parametric amplifiers used as a frequency-changers [H03F](#))
- 7/005 . {by means of superconductive devices}
- 7/02 . by means of diodes ([H03D 7/14](#) - [H03D 7/22](#) take precedence)
- 7/04 . . having {a partially} negative resistance characteristic, e.g. tunnel diode
- 7/06 . by means of discharge tubes having more than two electrodes ([H03D 7/14](#) - [H03D 7/22](#) take precedence)
- 7/08 . . the signals to be mixed being applied between the same two electrodes
- 7/10 . . the signals to be mixed being applied between different pairs of electrodes
- 7/12 . by means of semiconductor devices having more than two electrodes ([H03D 7/14](#) - [H03D 7/22](#) take precedence)
- 7/125 . . {with field effect transistors}
- 7/14 . Balanced arrangements
- 7/1408 . . {with diodes}
- 7/1416 . . {with discharge tubes having more than two electrodes}
- 7/1425 . . {with transistors}
- 7/1433 . . . {using bipolar transistors ([H03D 7/145](#) takes precedence)}
- 7/1441 . . . {using field-effect transistors ([H03D 7/145](#) takes precedence)}
- 7/145 . . . {using a combination of bipolar transistors and field-effect transistors}
- 7/1458 . . . {Double balanced arrangements, i.e. where both input signals are differential}
- 7/1466 . . . {Passive mixer arrangements}
- 7/1475 . . . {Subharmonic mixer arrangements}
- 7/1483 . . . {comprising components for selecting a particular frequency component of the output}
- 7/1491 . . . {Arrangements to linearise a transconductance stage of a mixer arrangement}
- 7/16 . Multiple-frequency-changing
- 7/161 . . {all the frequency changers being connected in cascade}
- 7/163 . . . {the local oscillations of at least two of the frequency changers being derived from a single oscillator}
- 7/165 . . {at least two frequency changers being located in different paths, e.g. in two paths with carriers in quadrature (combined with amplitude demodulation [H03D 1/2245](#), combined with angle demodulation [H03D 3/007](#); N-path filters [H03H 19/002](#))}
- 7/166 . . . {using two or more quadrature frequency translation stages}
- 7/168 {using a feedback loop containing mixers or demodulators}
- 7/18 . Modifications of frequency-changers for eliminating image frequencies {([H03D 7/16](#) takes precedence)}

- 7/20 . by means of transit-time tubes
- 7/22 . by deflecting an electron beam in a discharge tube
([H03D 7/20](#) takes precedence)
- 9/00 Demodulation or transference of modulation of modulated electromagnetic waves (demodulating light, transferring modulation in light waves [G02F 2/00](#))**
- 9/02 . Demodulation using distributed inductance and capacitance, e.g. in feeder lines
- 9/04 . . for angle-modulated oscillations
- 9/06 . Transference of modulation using distributed inductance and capacitance
- 9/0608 . . {by means of diodes}
- 9/0616 . . . {mounted in a hollow waveguide
([H03D 9/0641](#) takes precedence)}
- 9/0625 . . . {mounted in a coaxial resonator structure}
- 9/0633 . . . {mounted on a stripline circuit}
- 9/0641 {located in a hollow waveguide}
- 9/065 . . {by means of discharge tubes having more than two electrodes}
- 9/0658 . . {by means of semiconductor devices having more than two electrodes}
- 9/0666 . . . {using bipolar transistors ([H03D 9/0683](#) takes precedence)}
- 9/0675 . . . {using field effect transistors ([H03D 9/0683](#) takes precedence)}
- 9/0683 . . . {using a combination of bipolar transistors and field effect transistors}
- 2009/0691 . . {by means of superconductive devices}
- 11/00 Super-regenerative demodulator circuits {(applications in responders [G01S](#))}**
- 11/02 . for amplitude-modulated oscillations
- 11/04 . . by means of semiconductor devices having more than two electrodes
- 11/06 . for angle-modulated oscillations
- 11/08 . . by means of semiconductor devices having more than two electrodes
- 13/00 Circuits for comparing the phase or frequency of two mutually-independent oscillations {(measuring phase [G01R 25/00](#); phase-discriminators with yes/no output [G01R 25/005](#))}**
- 13/001 . {in which a pulse counter is used followed by a conversion into an analog signal}
- 13/002 . . {the counter being an up-down counter}
- 13/003 . {in which both oscillations are converted by logic means into pulses which are applied to filtering or integrating means}
- 13/004 . . {the logic means delivering pulses at more than one terminal, e.g. up and down pulses}
- 13/005 . {in which one of the oscillations is, or is converted into, a signal having a special waveform, e.g. triangular}
- 13/006 . . {and by sampling this signal by narrow pulses obtained from the second oscillation}
- 13/007 . {by analog multiplication of the oscillations or by performing a similar analog operation on the oscillations}
- 13/008 . . {using transistors}
- 13/009 . . {using diodes}
- 99/00 Subject matter not provided for in other groups of this subclass**
- 2200/00 Indexing scheme relating to details of demodulation or transference of modulation from one carrier to another covered by [H03D](#)**
- 2200/0001 . Circuit elements of demodulators
- 2200/0003 . . Rat race couplers
- 2200/0005 . . Wilkinson power dividers or combiners
- 2200/0007 . . Dual gate field effect transistors
- 2200/0009 . . Emitter or source coupled transistor pairs or long tail pairs
- 2200/0011 . . Diodes
- 2200/0013 . . . Diodes connected in a ring configuration
- 2200/0015 . . . Diodes connected in a star configuration
- 2200/0017 . . Intermediate frequency filter
- 2200/0019 . . Gilbert multipliers
- 2200/0021 . . Frequency multipliers
- 2200/0023 . . Balun circuits
- 2200/0025 . . Gain control circuits
- 2200/0027 . . . including arrangements for assuring the same gain in two paths
- 2200/0029 . . Loop circuits with controlled phase shift
- 2200/0031 . . PLL circuits with quadrature locking, e.g. a Costas loop
- 2200/0033 . . Current mirrors
- 2200/0035 . . Digital multipliers and adders used for detection
- 2200/0037 . . Diplexers
- 2200/0039 . . Exclusive OR logic circuits
- 2200/0041 . Functional aspects of demodulators
- 2200/0043 . . Bias and operating point
- 2200/0045 . . Calibration of demodulators
- 2200/0047 . . Offset of DC voltage or frequency
- 2200/0049 . . Analog multiplication for detection
- 2200/005 . . Analog to digital conversion
- 2200/0052 . . Digital to analog conversion
- 2200/0054 . . Digital filters
- 2200/0056 . . . including a digital decimation filter
- 2200/0058 . . . using a digital filter with interpolation
- 2200/006 . . Signal sampling
- 2200/0062 . . . Computation of input samples, e.g. successive samples
- 2200/0064 . . Detection of passages through null of a signal
- 2200/0066 . . Mixing
- 2200/0068 . . . by computation
- 2200/007 . . . by using a logic circuit, e.g. flipflop, XOR
- 2200/0072 . . . by complex multiplication
- 2200/0074 . . . using a resistive mixer or a passive mixer
- 2200/0076 . . . using a distributed mixer
- 2200/0078 . . . using a switched phase shifter or delay line
- 2200/008 . . Hilbert type transformation
- 2200/0082 . . Quadrature arrangements
- 2200/0084 . . Lowering the supply voltage and saving power
- 2200/0086 . . Reduction or prevention of harmonic frequencies
- 2200/0088 . . Reduction of intermodulation, nonlinearities, adjacent channel interference; intercept points of harmonics or intermodulation products
- 2200/009 . . Reduction of local oscillator or RF leakage
- 2200/0092 . . Detection or reduction of fading in multipath transmission arrangements
- 2200/0094 . . Measures to address temperature induced variations of demodulation
- 2200/0096 . . . by stabilising the temperature
- 2200/0098 . . . by compensating temperature induced variations