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)
1/02 . Details
1/04 . . Modifications of demodulators to reduce interference by undesired signals
1/06 . . Modifications of demodulators to reduce distortion, e.g. by negative feedback
1/08 . by means of non-linear two-pole elements (H03D 1/22, H03D 1/26, H03D 1/28 take precedence)
1/10 . . of diodes
1/12 . . . with provision for equalising AC and DC loads
1/14 . by means of non-linear elements having more than two poles (H03D 1/22, H03D 1/26, H03D 1/28 take precedence)
1/16 . . of discharge tubes
1/18 . . of semiconductor devices
1/20 . . with provision for preventing undesired type of demodulation, e.g. preventing anode detection in a grid detection circuit
1/22 . Homodyne or synchrodyne circuits {(receiver circuits H04B 1/30)}
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}
1/2272 . . {using FET's (H03D 1/2209, H03D 1/2245 and H03D 1/2281 take precedence)}
1/2281 . . {using a phase locked loop (H03D 1/2236 and H03D 1/2254 take precedence)}
1/229 . . {using at least a two emittor-coupled differential pair of transistors (H03D 1/2209 - H03D 1/2281 take precedence)}
1/24 . . for demodulation of signals wherein one sideband or the carrier has been wholly or partially suppressed {(receiver circuits H04B 1/302)}
1/26 . by means of transit-time tubes
1/28 . by deflecting an electron beam in a discharge tube (H03D 1/26 takes precedence)

3/00 **Demodulation of angle-, {frequency- or phase-} modulated oscillations** (H03D 5/00, H03D 9/00, H03D 11/00 take precedence)
3/001 . {Details of arrangements applicable to more than one type of frequency demodulator (H03D 3/28 takes precedence)}
3/002 . . {Modifications of demodulators to reduce interference by undesired signals (H03D 3/248 takes precedence)}
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)}
3/004 . . . {wherein the demodulated signal is used for controlling an oscillator, e.g. the local oscillator}
3/005 . . . {wherein the demodulated signal is used for controlling a bandpass filter (automatic bandwidth control H03G; automatic frequency control H03J 7/02)}

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