

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H03 BASIC 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.

<b>1/00</b>	<b>Demodulation of amplitude-modulated oscillations</b> ( <a href="#">H03D 5/00</a> , <a href="#">H03D 9/00</a> , <a href="#">H03D 11/00</a> take precedence)	<b>1/229</b>	• • {using at least a two emitter-coupled differential pair of transistors ( <a href="#">H03D 1/2209</a> - <a href="#">H03D 1/2281</a> take precedence)}
<b>1/02</b>	• Details	<b>1/24</b>	• • for demodulation of signals wherein one sideband or the carrier has been wholly or partially suppressed {(receiver circuits <a href="#">H04B 1/302</a> )}
<b>1/04</b>	• • Modifications of demodulators to reduce interference by undesired signals	<b>1/26</b>	• by means of transit-time tubes
<b>1/06</b>	• • Modifications of demodulators to reduce distortion, e.g. by negative feedback	<b>1/28</b>	• by deflecting an electron beam in a discharge tube ( <a href="#">H03D 1/26</a> takes precedence)
<b>1/08</b>	• by means of non-linear two-pole elements ( <a href="#">H03D 1/22</a> , <a href="#">H03D 1/26</a> , <a href="#">H03D 1/28</a> take precedence)	<b>3/00</b>	<b>Demodulation of angle-, {frequency- or phase-} modulated oscillations</b> ( <a href="#">H03D 5/00</a> , <a href="#">H03D 9/00</a> , <a href="#">H03D 11/00</a> take precedence)
<b>1/10</b>	• • of diodes	<b>3/001</b>	• {Details of arrangements applicable to more than one type of frequency demodulator ( <a href="#">H03D 3/28</a> takes precedence)}
<b>1/12</b>	• • • with provision for equalising ac and dc loads	<b>3/002</b>	• • {Modifications of demodulators to reduce interference by undesired signals ( <a href="#">H03D 3/248</a> takes precedence)}
<b>1/14</b>	• by means of non-linear elements having more than two poles ( <a href="#">H03D 1/22</a> , <a href="#">H03D 1/26</a> , <a href="#">H03D 1/28</a> take precedence)	<b>3/003</b>	• • {Arrangements for reducing frequency deviation, e.g. by negative frequency feedback (combined with a phase locked loop demodulator <a href="#">H03D 3/242</a> ; changing frequency deviation for modulators <a href="#">H03C 3/06</a> )}
<b>1/16</b>	• • of discharge tubes	<b>3/004</b>	• • • {wherein the demodulated signal is used for controlling an oscillator, e.g. the local oscillator}
<b>1/18</b>	• • of semiconductor devices	<b>3/005</b>	• • • {wherein the demodulated signal is used for controlling a bandpass filter (automatic bandwidth control <a href="#">H03G</a> ; automatic frequency control <a href="#">H03J 7/02</a> )}
<b>1/20</b>	• • with provision for preventing undesired type of demodulation, e.g. preventing anode detection in a grid detection circuit	<b>3/006</b>	• {by sampling the oscillations and further processing the samples, e.g. by computing techniques ( <a href="#">H03D 3/007</a> takes precedence)}
<b>1/22</b>	• Homodyne or synchrodyne circuits {(receiver circuits <a href="#">H04B 1/30</a> )}	<b>3/007</b>	• {by converting the oscillations into two quadrature related signals ( <a href="#">H03D 3/245</a> takes precedence)}
<b>1/2209</b>	• • {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}	<b>3/008</b>	• • {Compensating DC offsets}
<b>1/2218</b>	• • • {using diodes for the decoding}	<b>3/009</b>	• • {Compensating quadrature phase or amplitude imbalances}
<b>1/2227</b>	• • • {using switches for the decoding (diodes used as switches <a href="#">H03D 1/2218</a> )}		
<b>1/2236</b>	• • • {using a phase locked loop}		
<b>1/2245</b>	• • {using two quadrature channels ( <a href="#">H03D 1/2209</a> takes precedence)}		
<b>1/2254</b>	• • • {and a phase locked loop}		
<b>2001/2263</b>	• • • • {including a counter or a divider in the PLL}		
<b>1/2272</b>	• • {using FET's ( <a href="#">H03D 1/2209</a> , <a href="#">H03D 1/2245</a> and <a href="#">H03D 1/2281</a> take precedence)}		
<b>1/2281</b>	• • {using a phase locked loop ( <a href="#">H03D 1/2236</a> and <a href="#">H03D 1/2254</a> take precedence)}		

- 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](#))

<b>9/00</b>	<b>Demodulation or transference of modulation of modulated electromagnetic waves</b> ( <a href="#">demodulating light, transferring modulation in light waves G02F 2/00</a> )	2200/0001	. Circuit elements of demodulators
9/02	. Demodulation using distributed inductance and capacitance, e.g. in feeder lines	2200/0003	. . Rat race couplers
9/04	. . for angle-modulated oscillations	2200/0005	. . Wilkinson power dividers or combiners
9/06	. Transference of modulation using distributed inductance and capacitance	2200/0007	. . Dual gate field effect transistors
9/0608	. . {by means of diodes}	2200/0009	. . Emitter or source coupled transistor pairs or long tail pairs
9/0616	. . . {mounted in a hollow waveguide ( <a href="#">H03D 9/0641 takes precedence</a> )}	2200/0011	. . Diodes
9/0625	. . . {mounted in a coaxial resonator structure}	2200/0013	. . . Diodes connected in a ring configuration
9/0633	. . . {mounted on a stripline circuit}	2200/0015	. . . Diodes connected in a star configuration
9/0641	. . . . {located in a hollow waveguide}	2200/0017	. . Intermediate frequency filter
9/065	. . {by means of discharge tubes having more than two electrodes}	2200/0019	. . Gilbert multipliers
9/0658	. . {by means of semiconductor devices having more than two electrodes}	2200/0021	. . Frequency multipliers
9/0666	. . . {using bipolar transistors ( <a href="#">H03D 9/0683 takes precedence</a> )}	2200/0023	. . Balun circuits
9/0675	. . . {using field effect transistors ( <a href="#">H03D 9/0683 takes precedence</a> )}	2200/0025	. . Gain control circuits
9/0683	. . . {using a combination of bipolar transistors and field effect transistors}	2200/0027	. . . including arrangements for assuring the same gain in two paths
2009/0691	. . {by means of superconductive devices}	2200/0029	. . Loop circuits with controlled phase shift
<b>11/00</b>	<b>Super-regenerative demodulator circuits</b> {(applications in responders <a href="#">G01S</a> )}	2200/0031	. . PLL circuits with quadrature locking, e.g. a Costas loop
11/02	. for amplitude-modulated oscillations	2200/0033	. . Current mirrors
11/04	. . by means of semiconductor devices having more than two electrodes	2200/0035	. . Digital multipliers and adders used for detection
11/06	. for angle-modulated oscillations	2200/0037	. . Diplexers
11/08	. . by means of semiconductor devices having more than two electrodes	2200/0039	. . Exclusive OR logic circuits
<b>13/00</b>	<b>Circuits for comparing the phase or frequency of two mutually-independent oscillations</b> {(measuring phase <a href="#">G01R 25/00</a> ; phase-discriminators with yes/no output <a href="#">G01R 25/005</a> )}	2200/0041	. Functional aspects of demodulators
13/001	. {in which a pulse counter is used followed by a conversion into an analog signal}	2200/0043	. . Bias and operating point
13/002	. . {the counter being an up-down counter}	2200/0045	. . Calibration of demodulators
13/003	. {in which both oscillations are converted by logic means into pulses which are applied to filtering or integrating means}	2200/0047	. . Offset of DC voltage or frequency
13/004	. . {the logic means delivering pulses at more than one terminal, e.g. up and down pulses}	2200/0049	. . Analog multiplication for detection
13/005	. {in which one of the oscillations is, or is converted into, a signal having a special waveform, e.g. triangular}	2200/005	. . Analog to digital conversion
13/006	. . {and by sampling this signal by narrow pulses obtained from the second oscillation}	2200/0052	. . Digital to analog conversion
13/007	. {by analog multiplication of the oscillations or by performing a similar analog operation on the oscillations}	2200/0054	. . Digital filters
13/008	. . {using transistors}	2200/0056	. . . including a digital decimation filter
13/009	. . {using diodes}	2200/0058	. . . using a digital filter with interpolation
<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass</b>	2200/006	. . Signal sampling
<b>2200/00</b>	<b>Indexing scheme relating to details of demodulation or transference of modulation from one carrier to another covered by <a href="#">H03D</a></b>	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