

# 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.

#### 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.

<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)	1/2272	. . {using FET's ( <a href="#">H03D 1/2209</a> , <a href="#">H03D 1/2245</a> and <a href="#">H03D 1/2281</a> take precedence)}
1/02	. Details	1/2281	. . {using a phase locked loop ( <a href="#">H03D 1/2236</a> and <a href="#">H03D 1/2254</a> 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 ( <a href="#">H03D 1/2209</a> - <a href="#">H03D 1/2281</a> 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 <a href="#">H04B 1/302</a> )}
1/08	. 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)	1/26	. by means of transit-time tubes
1/10	. . of diodes	1/28	. by deflecting an electron beam in a discharge tube ( <a href="#">H03D 1/26</a> takes precedence)
1/12	. . . with provision for equalising ac and dc loads	<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)
1/14	. 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)	3/001	. {Details of arrangements applicable to more than one type of frequency demodulator ( <a href="#">H03D 3/28</a> takes precedence)}
1/16	. . of discharge tubes	3/002	. . {Modifications of demodulators to reduce interference by undesired signals ( <a href="#">H03D 3/248</a> 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 <a href="#">H03D 3/242</a> ; changing frequency deviation for modulators <a href="#">H03C 3/06</a> )}
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 <a href="#">H04B 1/30</a> )}	3/005	. . . {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> )}
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 <a href="#">H03D 1/2218</a> )}		
1/2236	. . . {using a phase locked loop}		
1/2245	. . {using two quadrature channels ( <a href="#">H03D 1/2209</a> 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	<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>
7/22	• by deflecting an electron beam in a discharge tube ( <a href="#">H03D 7/20</a> takes precedence)	2200/0001	• Circuit elements of demodulators
<b>9/00</b>	<b>Demodulation or transference of modulation of modulated electromagnetic waves (<a href="#">demodulating light, transferring modulation in light waves G02F 2/00</a>)</b>	2200/0003	• • Rat race couplers
9/02	• Demodulation using distributed inductance and capacitance, e.g. in feeder lines	2200/0005	• • Wilkinson power dividers or combiners
9/04	• • for angle-modulated oscillations	2200/0007	• • Dual gate field effect transistors
9/06	• Transference of modulation using distributed inductance and capacitance	2200/0009	• • Emitter or source coupled transistor pairs or long tail pairs
9/0608	• • {by means of diodes}	2200/0011	• • Diodes
9/0616	• • • {mounted in a hollow waveguide ( <a href="#">H03D 9/0641</a> takes precedence)}	2200/0013	• • • Diodes connected in a ring configuration
9/0625	• • • {mounted in a coaxial resonator structure}	2200/0015	• • • Diodes connected in a star configuration
9/0633	• • • {mounted on a stripline circuit}	2200/0017	• • Intermediate frequency filter
9/0641	• • • • {located in a hollow waveguide}	2200/0019	• • Gilbert multipliers
9/065	• • {by means of discharge tubes having more than two electrodes}	2200/0021	• • Frequency multipliers
9/0658	• • {by means of semiconductor devices having more than two electrodes}	2200/0023	• • Balun circuits
9/0666	• • • {using bipolar transistors ( <a href="#">H03D 9/0683</a> takes precedence)}	2200/0025	• • Gain control circuits
9/0675	• • • {using field effect transistors ( <a href="#">H03D 9/0683</a> takes precedence)}	2200/0027	• • • including arrangements for assuring the same gain in two paths
9/0683	• • • {using a combination of bipolar transistors and field effect transistors}	2200/0029	• • Loop circuits with controlled phase shift
2009/0691	• • {by means of superconductive devices}	2200/0031	• • PLL circuits with quadrature locking, e.g. a Costas loop
<b>11/00</b>	<b>Super-regenerative demodulator circuits {(<a href="#">applications in responders G01S</a>)}</b>	2200/0033	• • Current mirrors
11/02	• for amplitude-modulated oscillations	2200/0035	• • Digital multipliers and adders used for detection
11/04	• • by means of semiconductor devices having more than two electrodes	2200/0037	• • Diplexers
11/06	• for angle-modulated oscillations	2200/0039	• • Exclusive OR logic circuits
11/08	• • by means of semiconductor devices having more than two electrodes	2200/0041	• Functional aspects of demodulators
<b>13/00</b>	<b>Circuits for comparing the phase or frequency of two mutually-independent oscillations {(<a href="#">measuring phase G01R 25/00; phase-discriminators with yes/no output G01R 25/005</a>)}</b>	2200/0043	• • Bias and operating point
13/001	• {in which a pulse counter is used followed by a conversion into an analog signal}	2200/0045	• • Calibration of demodulators
13/002	• • {the counter being an up-down counter}	2200/0047	• • Offset of DC voltage or frequency
13/003	• {in which both oscillations are converted by logic means into pulses which are applied to filtering or integrating means}	2200/0049	• • Analog multiplication for detection
13/004	• • {the logic means delivering pulses at more than one terminal, e.g. up and down pulses}	2200/005	• • Analog to digital conversion
13/005	• {in which one of the oscillations is, or is converted into, a signal having a special waveform, e.g. triangular}	2200/0052	• • Digital to analog conversion
13/006	• • {and by sampling this signal by narrow pulses obtained from the second oscillation}	2200/0054	• • Digital filters
13/007	• {by analog multiplication of the oscillations or by performing a similar analog operation on the oscillations}	2200/0056	• • • including a digital decimation filter
13/008	• • {using transistors}	2200/0058	• • • using a digital filter with interpolation
13/009	• • {using diodes}	2200/006	• • Signal sampling
<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass</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