

**ECLA****EUROPEAN CLASSIFICATION****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 [H03K9/00](#); transforming types of pulse modulation [H03K11/00](#); coding, decoding or code conversion, in general [H03M](#); repeater stations [H04B7/14](#); demodulators adapted for ac systems of digital information transmission [H04L27/00](#); synchronous demodulators adapted for colour television [H04N9/66](#)) [[C9408](#)]

**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.

**H03D1/00**

**Demodulation of amplitude-modulated oscillations** ([H03D5/00](#), [H03D9/00](#), [H03D11/00](#) take precedence)

**H03D1/02**

- . Details

**H03D1/04**

- . . Modifications of demodulators to reduce interference by undesired signals

**H03D1/06**

- . . Modifications of demodulators to reduce distortion, e.g. by negative feedback

**H03D1/08**

- . by means of non-linear two-pole elements ([H03D1/22](#), [H03D1/26](#), [H03D1/28](#) take precedence)

**H03D1/10**

- . . of diodes

**H03D1/12**

- . . . with provision for equalising ac and dc loads

**H03D1/14**

- . by means of non-linear elements having more than two poles ([H03D1/22](#), [H03D1/26](#), [H03D1/28](#) take precedence)

**H03D1/16**

- . . of discharge tubes

**H03D1/18**

- . . of semiconductor devices

**H03D1/20**

- . . with provision for preventing undesired type of demodulation, e.g. preventing anode detection in a grid detection circuit

**H03D1/22**

- . Homodyne or synchrodyne circuits [N: (receiver circuits [H04B1/30](#))] [[C9704](#)]

**H03D1/22A**

- . . [N: 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]

**H03D1/22A1**

- . . . [N: using diodes for the decoding]

**H03D1/22A2**

- . . . [N: using switches for the decoding (diodes used as switches [H03D1/22A1](#))]

**H03D1/22A3**

- . . . [N: using a phase locked loop]

**H03D1/22E**

- . . [N: using two quadrature channels ([H03D1/22A](#) takes precedence)]

**H03D1/22E1**

- . . . [N: and a phase locked loop]

- H03D1/22F . . [N: using FET's ([H03D1/22A](#), [H03D1/22E](#) and [H03D1/22G](#) take precedence)]
- H03D1/22G . . [N: using a phase locked loop ([H03D1/22A3](#) and [H03D1/22E1](#) take precedence)]
- H03D1/22H . . [N: using at least a two emitter-coupled differential pair of transistors ([H03D1/22A](#) to [H03D1/22G](#) take precedence)]
- H03D1/24 . . for demodulation of signals wherein one sideband or the carrier has been wholly or partially suppressed [N: (receiver circuits [H04B1/30B](#))] [C9704]
- H03D1/26 . by means of transit-time tubes
- H03D1/28 . by deflecting an electron beam in a discharge tube ([H03D1/26](#) takes precedence)
- H03D3/00** **Demodulation of angle-, [N: frequency- or phase-] modulated oscillations ([H03D5/00](#), [H03D9/00](#), [H03D11/00](#) take precedence)**
- H03D3/00A . [N: Details of arrangements applicable to more than one type of frequency demodulator ([H03D3/28](#) takes precedence)]
- H03D3/00A1 . . [N: Modifications of demodulators to reduce interference by undesired signals ([H03D3/24A5](#) takes precedence)]
- H03D3/00A2 . . [N: Arrangements for reducing frequency deviation, e.g. by negative frequency feedback (combined with a phase locked loop demodulator [H03D3/24A1](#); changing frequency deviation for modulators [H03C3/06](#))]
- H03D3/00A2A . . . [N: wherein the demodulated signal is used for controlling an oscillator, e.g. the local oscillator]
- H03D3/00A2B . . . [N: wherein the demodulated signal is used for controlling a bandpass filter (automatic bandwidth control [H03G](#); automatic frequency control [H03J7/02](#))]
- H03D3/00B . [N: by sampling the oscillations and further processing the samples, e.g. by computing techniques ([H03D3/00C](#) takes precedence)]
- H03D3/00C . [N: by converting the oscillations into two quadrature related signals ([H03D3/24A3](#) takes precedence)]
- H03D3/00C1 . . [N: Compensating DC offsets] [N0204]
- H03D3/00C2 . . [N: Compensating quadrature phase or amplitude imbalances] [N0204]
- H03D3/02 . by detecting phase difference between two signals obtained from input signal ([H03D3/28](#) to [H03D3/32](#) take precedence; [N: muting in frequency-modulation receivers [H03G3/28](#)]; limiting arrangements [H03G11/00](#))
- H03D3/04 . . by counting or integrating cycles of oscillations [N: arrangements for measuring frequencies [G01R23/10](#)]
- H03D3/06 . . by combining signals additively or in product demodulators
- H03D3/08 . . . by means of diodes, e.g. Foster-Seeley discriminator
- H03D3/10 . . . . in which the diodes are simultaneously conducting during the same half period of the signal, e.g. radio detector
- H03D3/12 . . . by means of discharge tubes having more than two electrodes
- H03D3/14 . . . by means of semiconductor devices having more than two electrodes
- H03D3/16 . . . by means of electromechanical resonators
- H03D3/18 . . by means of synchronous gating arrangements
- H03D3/20 . . . producing pulses whose amplitude or duration depends on phase difference
- H03D3/22 . . 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
- H03D3/24 . . Modifications of demodulators to reject or remove amplitude variations by means of locked-in oscillator circuits
  - H03D3/24A . . . [N: the oscillator being part of a phase locked loop]
  - H03D3/24A1 . . . . [N: combined with means for controlling the frequency of a further oscillator, e.g. for negative frequency feedback or AFC]
  - H03D3/24A2 . . . . [N: combined with means for obtaining automatic gain control]
  - H03D3/24A3 . . . . [N: using at least twophase detectors in the loop ([H03D3/24A2](#) takes precedence; in general [H03L7/087](#))]
  - H03D3/24A4 . . . . [N: using a controlled phase shifter (in general [H03L7/081](#))]
  - H03D3/24A5 . . . . [N: with means for eliminating interfering signals, e.g. by multiple phase locked loops (multiple loops in general [H03L7/07](#), [H03L7/22](#))]
  
  - H03D3/26 . by means of sloping amplitude/frequency characteristic of tuned or reactive circuit ([H03D3/28](#) to [H03D3/32](#) takes precedence)
  - H03D3/28 . Modifications of demodulators to reduce effects of temperature variations ([N: automatic frequency regulation in receivers [H03J](#)]; automatic frequency control [H03L](#))
  - H03D3/30 . by means of transit-time tubes
  - H03D3/32 . by deflecting an electron beam in a discharge tube ([H03D3/30](#) takes precedence)
  - H03D3/34 . by means of electromechanical devices ([H03D3/16](#) takes precedence)
  
  - H03D5/00** **Circuits for demodulating amplitude-modulated or angle-modulated oscillations at will** ([H03D9/00](#), [H03D11/00](#) take precedence)
  
  - H03D7/00** **Transference of modulation from one carrier to another, e.g. frequency-changing** ([H03D9/00](#), [H03D11/00](#) take precedence; dielectric amplifiers, magnetic amplifiers, parametric amplifiers used as a frequency-changers [H03E](#))
  
  - H03D7/00A . [N: by means of superconductive devices] [N0210]
  - H03D7/02 . by means of diodes ([H03D7/14](#) to [H03D7/22](#) take precedence)
  - H03D7/04 . . having [N: a partially] negative resistance characteristic, e.g. tunnel diode
  - H03D7/06 . by means of discharge tubes having more than two electrodes ([H03D7/14](#) to [H03D7/22](#) take precedence)
  - H03D7/08 . . the signals to be mixed being applied between the same two electrodes
  - H03D7/10 . . the signals to be mixed being applied between different pairs of electrodes
  - H03D7/12 . by means of semiconductor devices having more than two electrodes ([H03D7/14](#) to [H03D7/22](#) take precedence)
  - H03D7/12A . . [N: with field effect transistors]
  - H03D7/14 . Balanced arrangements
  - H03D7/14A . . [N: with diodes]

- H03D7/14B . . [N: with discharge tubes having more than two electrodes]
- H03D7/14C . . [N: with transistors] [N0201] [C1207]
- [N: **WARNING**  
Subgroups [H03D7/14C1](#) to [H03D7/14C8](#) are incomplete pending reclassification;  
see also this group and its other subgroups [N1208]  
]
- H03D7/14C1 . . . [N: using bipolar transistors (H03D7/14C3 takes precedence)] [N1204]
- H03D7/14C2 . . . [N: using field-effect transistors (H03D7/14C3 takes precedence)] [N1204]
- H03D7/14C3 . . . [N: using a combination of bipolar transistors and field-effect transistors]  
[N1204]
- H03D7/14C4 . . . [N: Double balanced arrangements, i.e. where both input signals are differential]  
[N1204]
- H03D7/14C5 . . . [N: Passive mixer arrangements] [N1204]
- H03D7/14C6 . . . [N: Subharmonic mixer arrangements] [N1204]
- H03D7/14C7 . . . [N: comprising components for selecting a particular frequency component of  
the output] [N1204]
- H03D7/14C8 . . . [N: Arrangements to linearise a transconductance stage of a mixer  
arrangement] [N1204]
- H03D7/16 . Multiple-frequency-changing
- H03D7/16B . . [N: all the frequency changers being connected in cascade] [N9408]
- H03D7/16B1 . . . [N: the local oscillations of at least two of the frequency changers being derived  
from a single oscillator] [N9408]
- H03D7/16C . . [N: at least two frequency changers being located in different paths, e.g. in two  
paths with carriers in quadrature (combined with amplitude demodulation  
[H03D1/22E](#), combined with angle demodulation [H03D3/00C](#); N-path filters  
[H03H19/00A](#))] [N9408]
- H03D7/16C1 . . . [N: using two or more quadrature frequency translation stages] [N0202]
- H03D7/16C1F . . . . [N: using a feedback loop containing mixers or demodulators] [N0210]
- H03D7/18 . Modifications of frequency-changers for eliminating image frequencies [N: ([H03D7/16](#)  
takes precedence)] [C9408]
- H03D7/20 . by means of transit-time tubes
- H03D7/22 . by deflecting an electron beam in a discharge tube ([H03D7/20](#) takes precedence)
- H03D9/00** **Demodulation or transference of modulation of modulated electromagnetic waves**  
(demodulating light, transferring modulation in light waves [G02F2/00](#))
- H03D9/02 . Demodulation using distributed inductance and capacitance, e.g. in feeder lines
- H03D9/04 . . for angle-modulated oscillations
- H03D9/06 . Transference of modulation using distributed inductance and capacitance
- H03D9/06A . . [N: by means of diodes]
- H03D9/06A1 . . . [N: mounted in a hollow waveguide ([H03D9/06A3A](#) takes precedence)]
- H03D9/06A2 . . . [N: mounted in a coaxial resonator structure]
- H03D9/06A3 . . . [N: mounted on a stripline circuit]

- H03D9/06A3A . . . . [N: located in a hollow waveguide]
- H03D9/06B . . [N: by means of discharge tubes having more than two electrodes]
- H03D9/06C . . [N: by means of semiconductor devices having more than two electrodes]
- H03D9/06C2 . . . [N: using bipolar transistors ([H03D9/06C6](#) takes precedence)] [N0210]
- H03D9/06C4 . . . [N: using field effect transistors ([H03D9/06C6](#) takes precedence)] [N0210]
- H03D9/06C6 . . . [N: using a combination of bipolar transistors and field effect transistors] [N0210]
  
- H03D11/00**            **Super-regenerative demodulator circuits** [N: applications in responders [G01S](#)]
  
- H03D11/02 . for amplitude-modulated oscillations
- H03D11/04 . . by means of semiconductor devices having more than two electrodes
  
- H03D11/06 . for angle-modulated oscillations
- H03D11/08 . . by means of semiconductor devices having more than two electrodes
  
- H03D13/00**            **Circuits for comparing the phase or frequency of two mutually-independant oscillations** [N: (measuring phase [G01R25/00](#); phase-discriminators with yes/no output [G01R25/00D](#))]
  
- H03D13/00A . [N: in which a pulse counter is used followed by a conversion into an analog signal]
- H03D13/00A1 . . [N: the counter being an up-down counter]
  
- H03D13/00B . [N: in which both oscillations are converted by logic means into pulses which are applied to filtering or integrating means]
- H03D13/00B1 . . [N: the logic means delivering pulses at more than one terminal, e.g. up and down pulses]
  
- H03D13/00C . [N: in which one of the oscillations is, or is converted into, a signal having a special waveform, e.g. triangular]
- H03D13/00C1 . . [N: and by sampling this signal by narrow pulses obtained from the second oscillation]
  
- H03D13/00D . [N: by analog multiplication of the oscillations or by performing a similar analog operation on the oscillations]
- H03D13/00D1 . . [N: using transistors]
- H03D13/00D2 . . [N: using diodes]
  
- H03D99/00**            **Subject matter not provided for in other groups of this subclass** [N0704]