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)

Definition statement

This place covers:

Demodulation or transference of signals modulated on a sinusoidal carrier or on electromagnetic waves.

Relationships with other classification places

The modulation and demodulation of pulse trains, for example in Pulse Width Modulation circuits, is covered in subclass H03K.

System aspects of modulation by digital signals of the frequency, phase or amplitude of a sinusoidal carrier, or carriers, for example in quadrature (I-Q) modulation systems, and the demodulation thereof, is covered in subclass H04L.

Analogue quadrature modulation used in the NTSC and PAL colour television systems (where the I and Q signals representing colour difference values are substantially continuously variable), and the demodulation of these signals, is covered in H04N.

The modulation of sinusoidal signals, for example in AM and FM broadcasting, is covered in sub class H03C.

References

Limiting references

This place does not cover:

Masers, lasers	H01S
Circuits capable of acting both as modulator and demodulator;balanced modulators	H03C
Details applicable to both modulators and frequency changers	H03C
Demodulating pulses which have been modulated with a continuously variable signal	H03K 9/00
Transforming types of pulse modulation	H03K 11/00
Phase locked loops; phase comparators therein	H03L 7/08 - H03L 7/097
Relay systems, e.g. repeater stations	H04B 7/14
Demodulators adapted for digitally modulated-carrier systems	H04L 27/00
Synchronous demodulators adapted for colour television	H04N 9/66

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coding, decoding or code conversion, in general	H03M
Further details of receivers within transmission systems	H04B 1/06
Further circuits for superheterodyne receivers within transmission systems	H04B 1/26

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Homodyne, synchrodyne or zero-IF receiver	A receiver in which the local oscillator (LO) frequency is set to the same frequency as the received RF carrier frequency resulting in direct conversion of the received signal to a baseband (or zero IF) frequency for information recovery. In a near-zero IF receiver, the LO frequency is set very close to the carrier frequency of the RF signal.
Superheterodyne receiver	A receiver in which a received RF signal is converted to an intermediate frequency (IF) by at least one stage of frequency conversion (e.g. a 'mixer' stage which forms the product of the RF signal and a local oscillator signal)

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

Superhet	A superheterodyne receiver
Double (multiple) superhet	A double-conversion receiver using two intermediate frequencies, i.e. a superhet receiver in which a received RF signal passes through two (or more) successive stages of frequency conversion to different intermediate frequencies, one of which may be zero-IF or baseband.

H03D 1/00

Demodulation of amplitude-modulated oscillations (H03D 5/00, H03D 9/00, H03D 11/00 take precedence)

Definition statement

This place covers:

Demodulation of signals being amplitude-modulated on a sinusoidal carrier.

References

Limiting references

This place does not cover:

Circuits for demodulating amplitude-modulated or angle-modulated oscillations at will	H03D 5/00
Demodulation or transference of modulation of modulated electromagnetic waves	H03D 9/00

Super-regenerative demodulator circuits	H03D 11/00
Amplitude demodulators adapted for digitally modulated-carrier systems, e.g. using on-off keying; Single sideband orvestigial sideband modulation	H04L 27/06

Informative references

Attention is drawn to the following places, which may be of interest for search:

Homodyne or synchrodyne single sideband receivers	H04B 1/302

Special rules of classification

Documents should in general be classified in all subgroups which apply, e.g. a single sideband modulator may, in addition to H03C 1/60, be classified in H03C 1/36, if it is a transistor type.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

IP2	Second Order Intercept Point
IM2	Second order intermodulation product

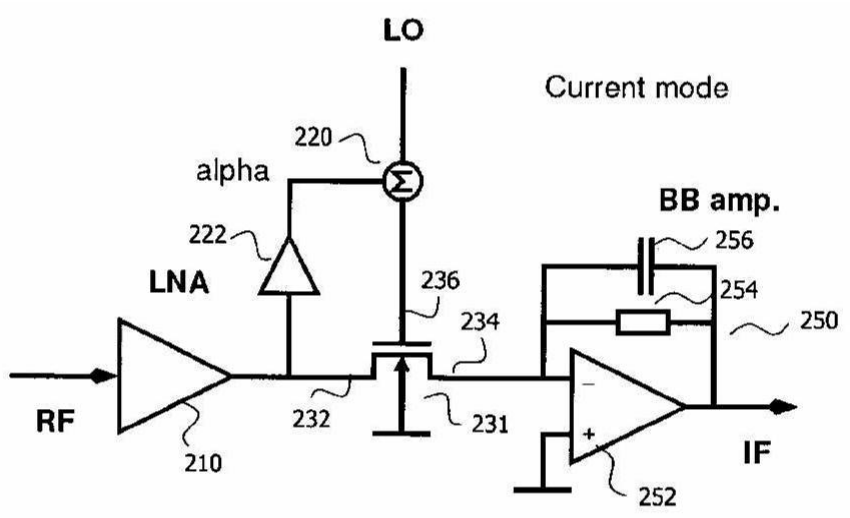
H03D 1/04

Modifications of demodulators to reduce interference by undesired signals

Definition statement

This place covers:

Example:



WO2011047703

IM2 reduction e.g. by summing RF signal to LO

H03D 1/08

by means of non-linear two-pole elements (H03D 1/22, H03D 1/26, H03D 1/28 take precedence)

References

Limiting references

This place does not cover:

Homodyne or synchrodyne circuits	H03D 1/22
Demodulation of amplitude-modulated oscillations by means of transit-time tubes	H03D 1/26
Demodulation of amplitude-modulated oscillations by deflecting an electron beam in a discharge tube	H03D 1/28

H03D 1/14

by means of non-linear elements having more than two poles (H03D 1/22, H03D 1/26, H03D 1/28 take precedence)

References

Limiting references

This place does not cover:

Homodyne or synchrodyne circuits	H03D 1/22
Demodulation of amplitude-modulated oscillations by means of transit-time tubes	H03D 1/26
Demodulation of amplitude-modulated oscillations by deflecting an electron beam in a discharge tube	H03D 1/28

H03D 1/18

of semiconductor devices

Definition statement

This place covers:

Example:

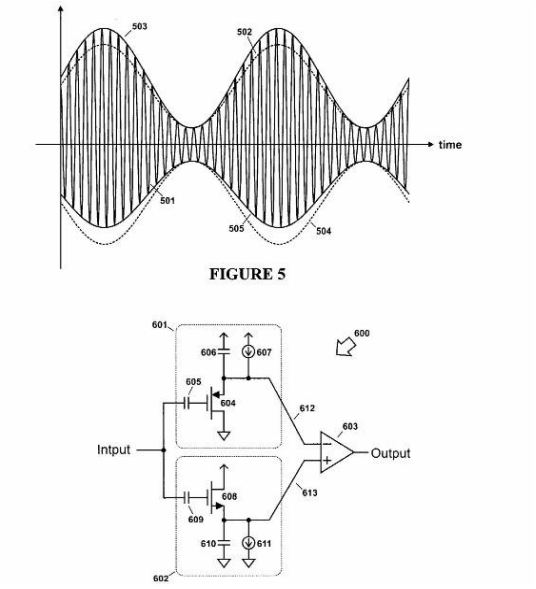


FIGURE 5

US2009015295

Amplitude demodulation using e.g. MOS transistors

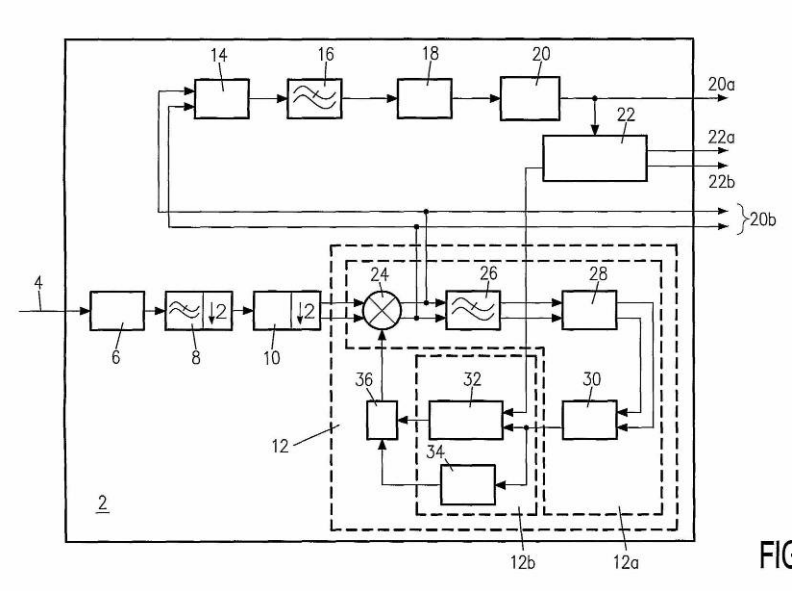
H03D 1/22

Homodyne or synchrodyne circuits {(receiver circuits H04B 1/30)}

Definition statement

This place covers:

Example:



FIG

EP2315350

Demodulation using two quadrature channels (20b) and a PLL (12) in a synchronous circuit. (Analog/ digital converter 6, decimation filter 8, Hilbert filter 10; elements 14, 16, 18, 20, 22 are not relevant for the demodulation principle)

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Homodyne or synchrodyne receiver circuits	H04B 1/30

H03D 1/2227

{using switches for the decoding (diodes used as switches H03D 1/2218)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Diodes used as switches	H03D 1/2218

H03D 1/2245

{using two quadrature channels (H03D 1/2209 takes precedence)}

References

Limiting references

This place does not cover:

Decoders for simultaneous demodulation and decoding of signals composed of a sum-signal and a suppressed carrier, amplitude modulated by a difference signal	H03D 1/2209

H03D 1/2254

{and a phase locked loop}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mean frequency regulation of modulators using a phase locked loop	H03C 3/0908

H03D 1/2272

{using FET's (H03D 1/2209, H03D 1/2245 and H03D 1/2281 take precedence)}

References

Limiting references

This place does not cover:

Decoders for simultaneous demodulation and decoding of signals composed of a sum-signal and a suppressed carrier, amplitude modulated by a difference signal	H03D 1/2209
Using two quadrature channels	H03D 1/2245
Using a phase locked loop	H03D 1/2281

H03D 1/24

for demodulation of signals wherein one sideband or the carrier has been wholly or partially suppressed {(receiver circuits H04B 1/302)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Receiver circuits	H04B 1/302

H03D 1/28

by deflecting an electron beam in a discharge tube (H03D 1/26 takes precedence)

References

Limiting references

This place does not cover:

Demodulation of amplitude-modulated oscillations by means of transit-time tubes	H03D 1/26

H03D 3/00

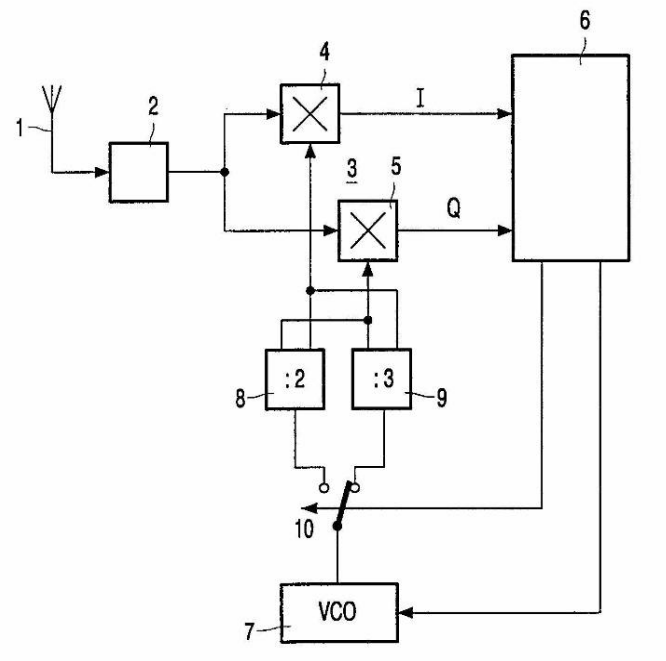
Demodulation of angle-, {frequency- or phase-} modulated oscillations (H03D 5/00, H03D 9/00, H03D 11/00 take precedence)

Definition statement

This place covers:

Demodulation of angle-, frequency- or phase- modulated oscillations.

Example:



EP1163719

FM demodulation by conversion into two quadrature related signals

References

Limiting references

This place does not cover:

Circuits for demodulating amplitude-modulated or angle-modulated oscillations at will	H03D 5/00
Demodulation or transference of modulation of modulated electromagnetic waves	H03D 9/00
Super-regenerative demodulator circuits	H03D 11/00
Frequency demodulators adapted for digitally modulated-carrier systems, i.e. using frequency-shift keying	H04L 27/14
Phase demodulators adapted for digitally modulated-carrier systems, i.e. using phase-shift keying	H04L 27/22

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for measuring frequencies; Arrangements for analyzing frequency spectra	G01R 23/00
Automatic bandwidth control	H03G
Muting in frequency-modulation receivers	H03G 3/28
Arrangements for limiting amplitude	H03G 11/00
Automatic frequency regulation in receivers	H03J
Automatic frequency control	H03L, H03J 7/02
Phase-locked loops in general	H03L 7/00
Multiple phase locked loops in general	H03L 7/07, H03L 7/22
Phase-locked loops using a controlled phase shifter in general	H03L 7/081
Phase-locked loops including two phase detectors in general	**H03L7/87**

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

I/Q	in-phase, quadrature

H03D 3/001

{Details of arrangements applicable to more than one type of frequency demodulator (H03D 3/28 takes precedence)}

References

Limiting references

This place does not cover:

Modifications of demodulators to reduce effects of temperature variations	H03D 3/28

H03D 3/002

{Modifications of demodulators to reduce interference by undesired signals (H03D 3/248 takes precedence)}

References

Limiting references

This place does not cover:

Angle demodulation by detecting phase difference between two signals obtained from input signal including locked-in oscillation circuits to reject or remove amplitude variations with means for eliminating interfering signals, e.g. by multiple phase locked loops	H03D 3/248

H03D 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)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Angle demodulation by detecting phase difference between two signals obtained from input signal including locked-in oscillation circuits to reject or remove amplitude variations combined with a phase locked loop demodulator	H03D 3/242
Changing frequency deviation for modulators	H03C 3/06

H03D 3/005

{wherein the demodulated signal is used for controlling a bandpass filter (automatic bandwidth control H03G; automatic frequency control H03J 7/02)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Automatic bandwidth control	H03G
Automatic frequency control	H03J 7/02

H03D 3/006

{by sampling the oscillations and further processing the samples, e.g. by computing techniques (H03D 3/007 takes precedence)}

References

Limiting references

This place does not cover:

Angle demodulation by converting the oscillations into two quadrature related signals	H03D 3/007

H03D 3/007

{by converting the oscillations into two quadrature related signals (H03D 3/245 takes precedence)}

References

Limiting references

This place does not cover:

Angle demodulation by detecting phase difference between two signals obtained from input signal including locked-in oscillation circuits to reject or remove amplitude variations using at least two phase detectors in the loop	H03D 3/245

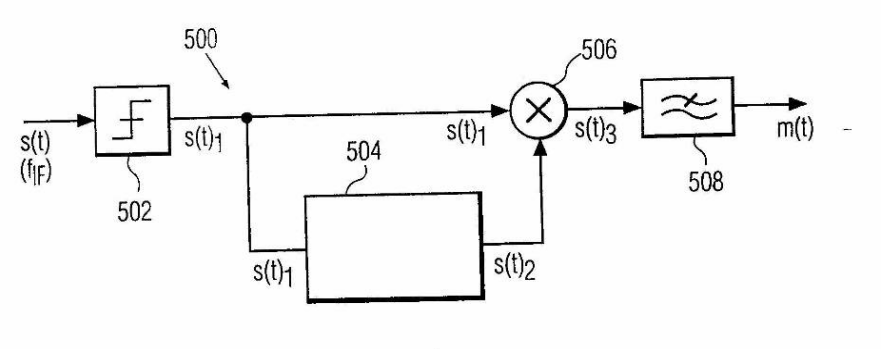
H03D 3/02

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)

Definition statement

This place covers:

Example:



EP1040565

Phase demodulation by mixing of two signals obtained from input signal. A phase shifter network (504) provides a phase shift of 90° at the center frequency.

References

Limiting references

This place does not cover:

Modifications of demodulators to reduce effects of temperature variations	H03D 3/28
Angle demodulation by means of transit-time tubes	H03D 3/30
Angle demodulation by deflecting an electron beam in a discharge tube	H03D 3/32

Informative references

Attention is drawn to the following places, which may be of interest for search:

Muting in frequency-modulation receivers	H03G 3/28
Limiting arrangements	H03G 11/00

H03D 3/04

by counting or integrating cycles of oscillations {(arrangements for measuring frequencies G01R 23/10)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for measuring frequencies	G01R 23/10

H03D 3/245

{using at least twophase detectors in the loop (H03D 3/244 takes precedence; in general H03L 7/087)}

References

Limiting references

This place does not cover:

Angle demodulation by detecting phase difference between two signals obtained from input signal including locked-in oscillation circuits to reject or remove amplitude variations combined with means for obtaining automatic gain control	H03D 3/244

Informative references

Attention is drawn to the following places, which may be of interest for search:

PLLs using at least two phase detectors in the loop in general	H03L 7/087

H03D 3/247

{using a controlled phase shifter (in general H03L 7/081)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

PLLs provided with an additional controlled phase shifter in general	H03L 7/081

H03D 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)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

PLLs with multiple loops in general	H03L 7/07, H03L 7/22

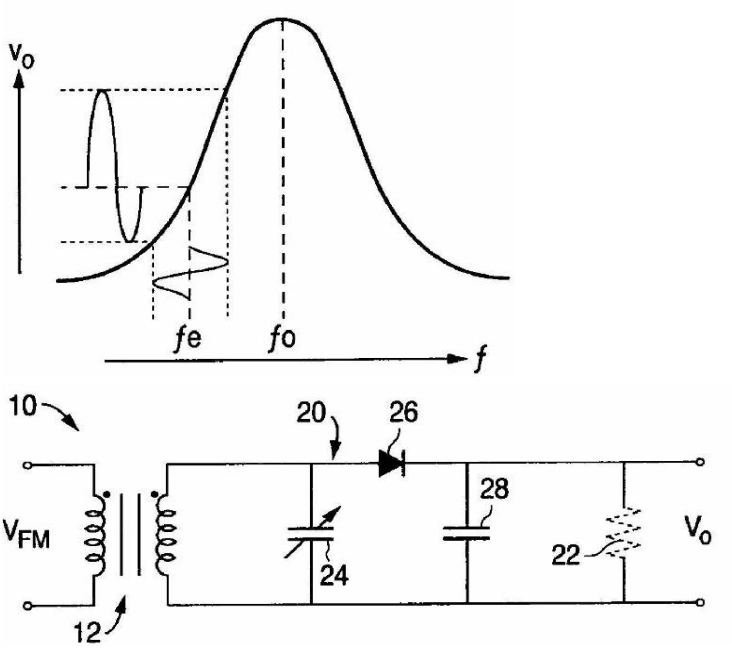
H03D 3/26

by means of sloping amplitude/frequency characteristic of tuned or reactive circuit (H03D 3/28 - H03D 3/32 takes precedence)

Definition statement

This place covers:

Example:



US2006226897

FM demodulation by is conversion to an amplitude modulated output signal (VO)

References

Limiting references

This place does not cover:

Modifications of demodulators to reduce effects of temperature variations	H03D 3/28
Angle demodulation by means of transit-time tubes	H03D 3/30
Angle demodulation by deflecting an electron beam in a discharge tube	H03D 3/32

H03D 3/28

Modifications of demodulators to reduce effects of temperature variations ({automatic frequency regulation in receivers H03J}; automatic frequency control H03L)

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Automatic frequency regulation in receivers	H03J
Automatic frequency control	H03L

H03D 3/32

by deflecting an electron beam in a discharge tube (H03D 3/30 takes precedence)

References

Limiting references

This place does not cover:

Demodulation of angle-modulated oscillations by means of transit-time tubes	H03D 3/30

H03D 3/34

by means of electromechanical devices (H03D 3/16 takes precedence)

Definition statement

This place covers:

FM Demodulation by means of electromechanical devices such as FBARs or piezoelectric resonators.

References

Limiting references

This place does not cover:

Demodulation of angle-modulated oscillations by detecting phase difference between two signals obtained from input signal by combining signals additively or in product demodulators by means of electromechanical resonators	H03D 3/16

H03D 5/00

Circuits for demodulating amplitude-modulated or angle-modulated oscillations at will (H03D 9/00, H03D 11/00 take precedence)

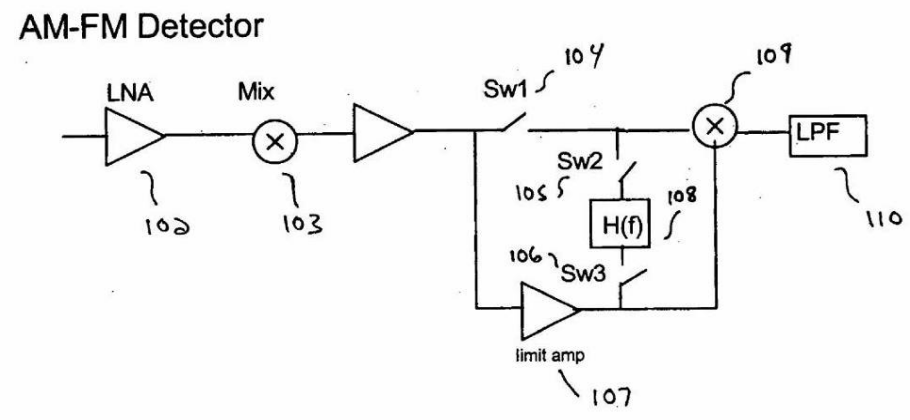
Definition statement

This place covers:

Circuits selectable between FM and AM demodulation

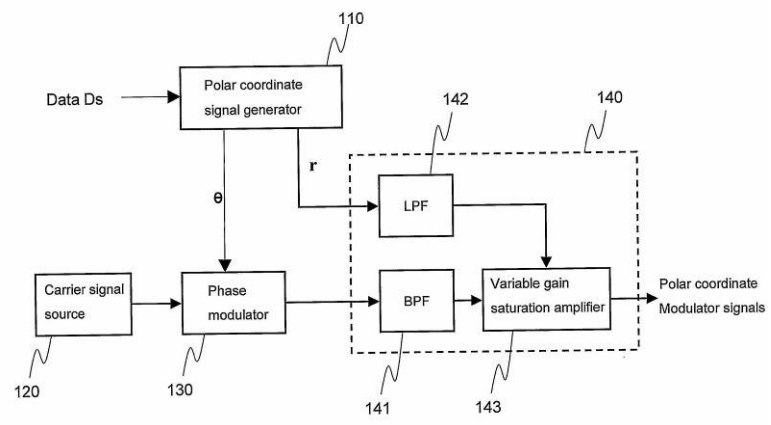
Polar or phase-amplitude demodulation

Example:



US2007178866

Demodulator switchable between AM demodulation



WO2007005139

Phase-amplitude-phase demodulation

References

Limiting references

This place does not cover:

Demodulation or transference of modulation of modulatedelectromagnetic waves	H03D 9/00
Super-regenerative demodulator circuits	H03D 11/00
Demodulators adapted for digitally modulated-carrier systems characterised by combinations of amplitude and angle modulation, e.g. quadrature-amplitude modulated carrier systems	H04L 27/38

Informative references

Attention is drawn to the following places, which may be of interest for search:

Polar or phase-amplitude modulation	H03C 5/00

H03D 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)

Definition statement

This place covers:

Mixer circuits in general, applicable to both transmitters or receivers.

References

Limiting references

This place does not cover:

Demodulation or transference of modulation of modulated electromagnetic waves	H03D 9/00
Super-regenerative demodulator circuits	H03D 11/00
Dielectric amplifiers, magnetic amplifiers, parametric amplifiers used as a frequency-changers H03F	H03F

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for performing computing operations, multiplication or division	G06G 7/16

H03D 7/02

by means of diodes (H03D 7/14 - H03D 7/22 take precedence)

References

Limiting references

This place does not cover:

Balanced arrangements	H03D 7/14
Multiple-frequency-changing	H03D 7/16
Modifications of frequency-changers for eliminating image frequencies	H03D 7/18
By means of transit-time tubes	H03D 7/20
By deflecting an electron beam in a discharge tube	H03D 7/22

H03D 7/06

by means of discharge tubes having more than two electrodes (H03D 7/14 - H03D 7/22 take precedence)

References

Limiting references

This place does not cover:

Balanced arrangements	H03D 7/14
Multiple-frequency-changing	H03D 7/16
Modifications of frequency-changers for eliminating image frequencies	H03D 7/18
By means of transit-time tubes	H03D 7/20
By deflecting an electron beam in a discharge tube	H03D 7/22

H03D 7/12

by means of semiconductor devices having more than two electrodes (H03D 7/14 - H03D 7/22 take precedence)

References

Limiting references

This place does not cover:

Balanced arrangements	H03D 7/14
Multiple-frequency-changing	H03D 7/16
Modifications of frequency-changers for eliminating image frequencies	H03D 7/18
By means of transit-time tubes	H03D 7/20
By deflecting an electron beam in a discharge tube	H03D 7/22

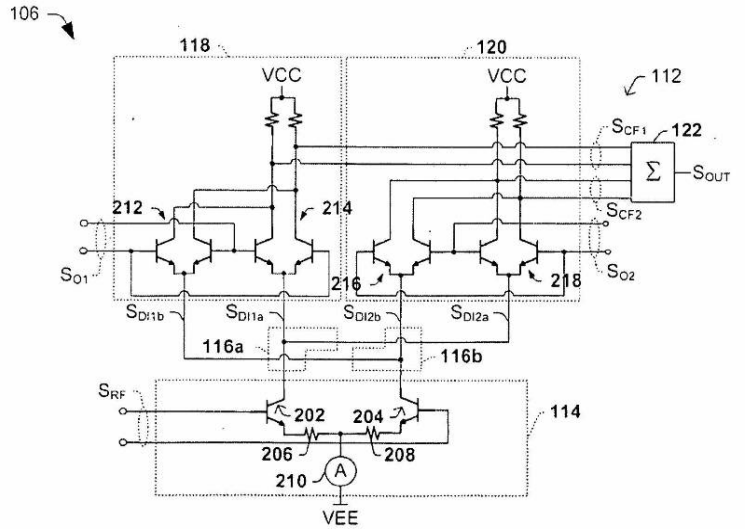
H03D 7/14

Balanced arrangements

Definition statement

This place covers:

Example:



DE102010002575

Balanced active mixer arrangement (Gilbert type)

H03D 7/1425

{with transistors}

References

Limiting references

This place does not cover:

Balanced arrangements using a combination of bipolar transistors and field-effect transistors	H03D 7/145

H03D 7/1441

{using field-effect transistors (H03D 7/145 takes precedence)}

References

Limiting references

This place does not cover:

Balanced arrangements using a combination of bipolar transistors and field-effect transistors	H03D 7/145

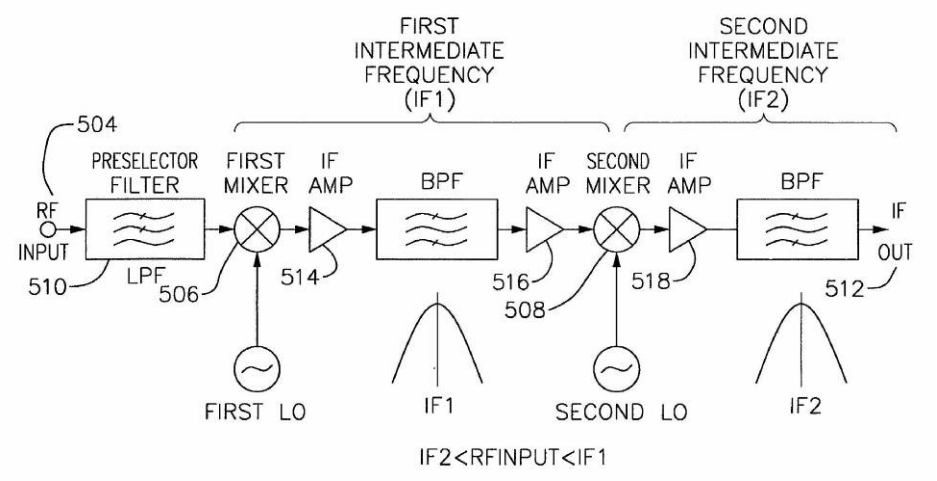
H03D 7/16

Multiple-frequency-changing

Definition statement

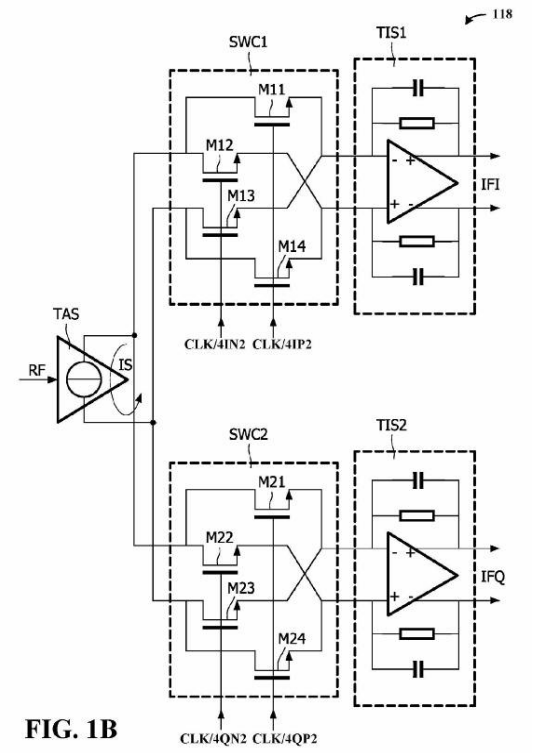
This place covers:

Examples:



US2001007151

Dual conversion receiver using two frequency changers being connected in cascade



EP2363952

Balanced passive mixer arrangement with two frequency changers located in different paths

References

Limiting references

This place does not cover:

Circuits for superheterodyne receivers on system level	H04B 1/26

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Q/I	quadrature / in-phase

H03D 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)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Homodyne or synchrodyne circuits for amplitude demodulation using two quadrature channels	H03D 1/2245
Angle demodulation by converting the oscillations into two quadrature related signals	H03D 3/007
N-path filters	H03H 19/002

H03D 7/18

Modifications of frequency-changers for eliminating image frequencies {(H03D 7/16 takes precedence)}

References

Limiting references

This place does not cover:

Multiple-frequency-changing	H03D 7/16

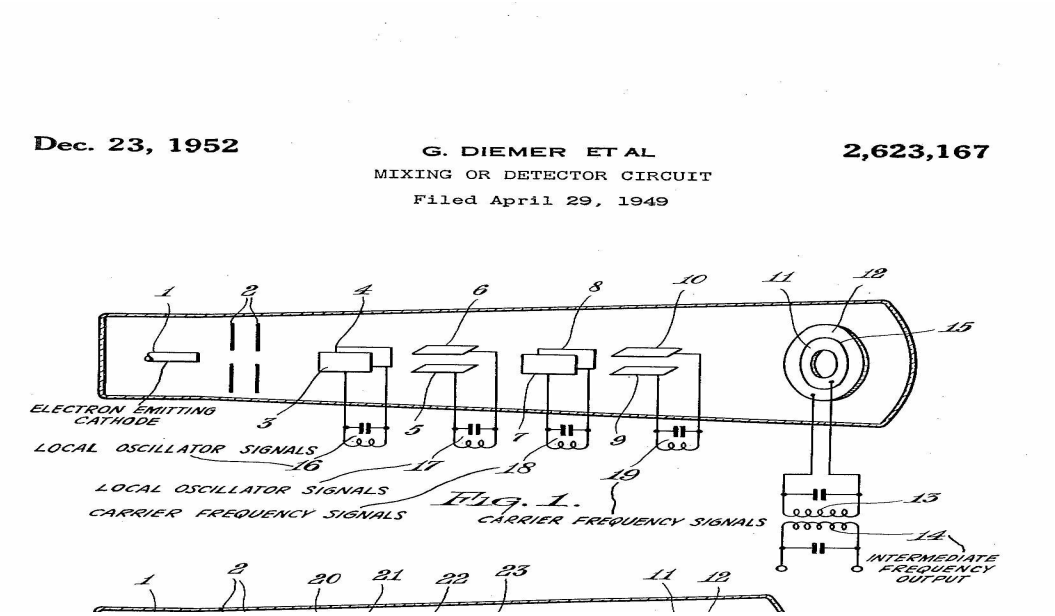
H03D 7/22

by deflecting an electron beam in a discharge tube (H03D 7/20 takes precedence)

Definition statement

This place covers:

Example:



US2623167:

Mixing of a signal ("carrier") frequency with a local oscillator frequency to obtainan intermediate frequency by means of a discharge tube.

References

Limiting references

This place does not cover:

Transference of modulation by means of transit-time tubes	H03D 7/20

H03D 9/00

Demodulation or transference of modulation of modulated electromagnetic waves (demodulating light, transferring modulation in light waves G02F 2/00)

Definition statement

This place covers:

- Demodulation using distributed inductance and capacitance H03D 9/02
- Transference of modulation using distributed inductance and capacitance H03D 9/06

References

Limiting references

This place does not cover:

Devices or arrangements for demodulating light transferring the modulation of modulated light or for changing the frequency of light	G02F 2/00

Further classification information:

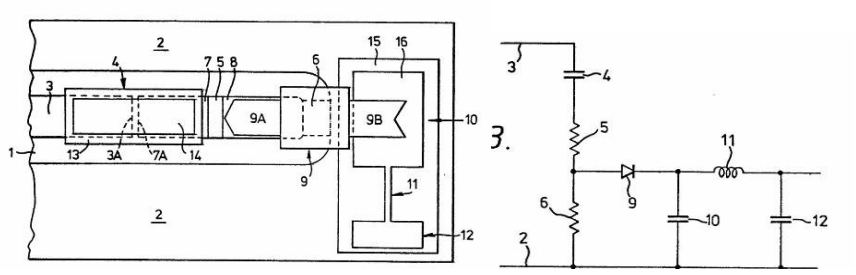
H03D 9/02

Demodulation using distributed inductance and capacitance, e.g. in feeder lines

Definition statement

This place covers:

Example:



GB2128827

Demodulation using a microwave detector including a transmission line (11) as distributed inductance

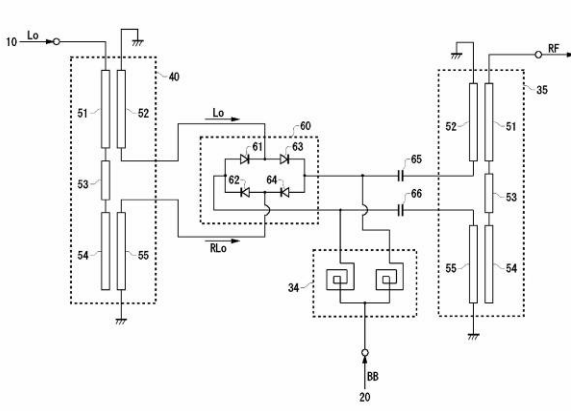
H03D 9/06

Transference of modulation using distributed inductance and capacitance

Definition statement

This place covers:

Example:



WO2009054095

Transference of modulation using a mixer based on diodes and microstrip lines (51, 54) as distributed inductances

H03D 9/0616

{mounted in a hollow waveguide (H03D 9/0641 takes precedence)}

References

Limiting references

This place does not cover:

Diodes mounted on a stripline circuit located in a hollow waveguide	H03D 9/0641

H03D 9/0666

{using bipolar transistors (H03D 9/0683 takes precedence)}

References

Limiting references

This place does not cover:

Using a combination of bipolar transistors and field effect transistors	H03D 9/0683

H03D 9/0675

{using field effect transistors (H03D 9/0683 takes precedence)}

References

Limiting references

This place does not cover:

Using a combination of bipolar transistors and field effect transistors	H03D 9/0683

H03D 11/00

Super-regenerative demodulator circuits {(applications in responders G01S)}

Definition statement

This place covers:

Super-regenerative demodulator circuits for amplitude modulation H03D 11/02

Super-regenerative demodulator circuits for angle modulation H03D 11/06

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Applications in responders	G01S

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Regenerative receiver; Super-regenerative receiver	A regenerative receiver is a receiver that uses feedback around an active device in a bandpass circuit, causing it to operate on the verge of oscillation. The active device may then provide high amplification of an RF signal in a receiver circuit that needs few components. In a super-regenerative receiver, the oscillation grows at the desired RF frequency and a lower frequency oscillation (within the same stage or from a second oscillator stage) periodically interrupts or "quenches" the main RF oscillation. This may occur at an ultrasonic rate.

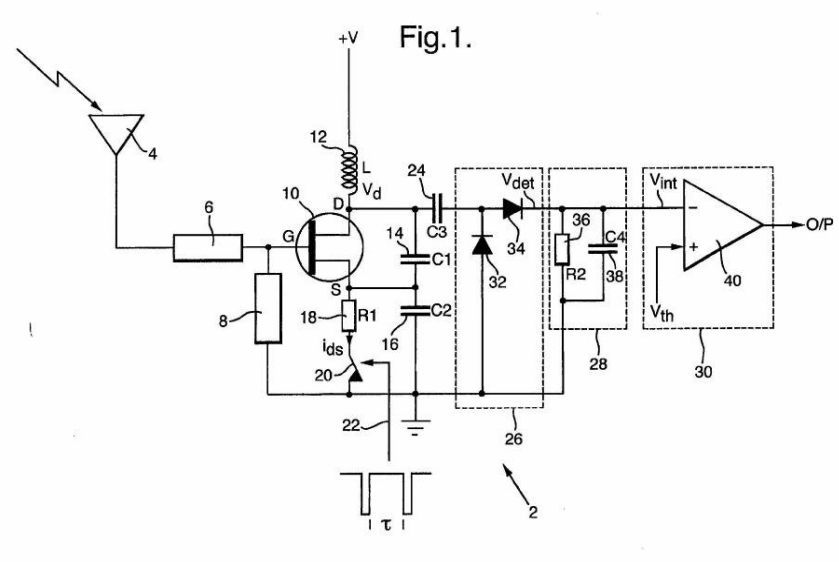
H03D 11/04

by means of semiconductor devices having more than two electrodes

Definition statement

This place covers:

Example:



GB2343571

Super regenerative demodulator

H03D 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)}

Definition statement

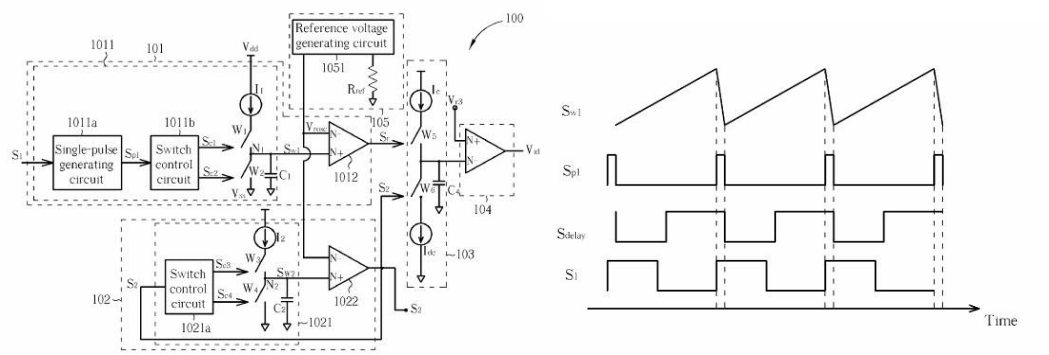
This place covers:

Phase or frequency comparators

- in which a pulse counter is used followed by a conversion into an analog signal H03D 13/001

- in which both oscillations are converted by logic means into pulses which
- are applied to filtering or integrating means H03D 13/003
- in which one of the oscillations is, or is converted into, a signal having a special waveform, e.g. triangular H03D 13/005
- by analog multiplication of the oscillations or by performing a similar analog operation on the oscillations H03D 13/007

Example:



US2008122491

Frequency comparator in which one signal (S1) is converted into a triangular waveform (Sw1) and compared with an internal oscillation (S2)

References

Limiting references

This place does not cover:

Arrangements for measuring phase angle between a voltage and a current or between voltages or currents	G01R 25/00
Phase-discriminators with yes/no output	G01R 25/005

Informative references

Attention is drawn to the following places, which may be of interest for search:

Phase locked loops; frequency or phase detectors or comparators therein	H03L 7/08- H03L 7/097

H03D 99/00

Subject matter not provided for in other groups of this subclass

Definition statement

This place covers:

Demodulation or transference of signals modulated on a sinusoidal carrier or on electromagnetic waves that does not comply with other groups of this subclass.

H03D 99/00

References

Limiting references

This place does not cover:

Demodulation of amplitude-modulated oscillations	H03D 1/00
Demodulation of angle-, frequency-or phase- modulated oscillations	H03D 3/00
Circuits for demodulating amplitude-modulated or angle-modulated oscillations at will	H03D 5/00
Transference of modulation from one carrier to another, e.g. frequency-changing	H03D 7/00
Demodulation or transference of modulation of modulated electromagnetic waves	H03D 9/00
Super-regenerative demodulator circuits by means of semiconductor devices having more than two electrodes	H03D 11/00
Circuits for comparing the phase or frequency of two mutually-independent oscillations	H03D 13/00

H03D 2200/00

Indexing scheme relating to details of demodulation or transference of modulation from one carrier to another covered by H03D

Definition statement

This place covers:

Particular circuit elements of demodulators **H03D200/01**

Functional aspects of demodulators **H03D200/02**

H03D 2200/0082

Quadrature arrangements

References

Limiting references

This place does not cover:

Homodyne or synchrodyne circuits for amplitude demodulation using quadrature channels	H03D 1/2245
Angle demodulation by converting the oscillations into two quadrature related signals	H03D 3/007
Multiple frequency changing with at least two frequency changers being located in different paths	H03D 7/165