H03G

CONTROL OF AMPLIFICATION

Definition statement

This place covers:

- Control of gain of amplifiers or frequency-changers
- Control of frequency range of amplifiers
- Limiting amplitude or rate of change of amplitude

References

Informative references

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

Amplifiers	H03F
Impedance networks, e.g. attenuators	H03H
Control of transmission in lines	H04B 3/04

H03G 1/00

Details of arrangements for controlling amplification

Definition statement

This place covers:

Details of gain control loops. The invention can be found in the details. This is opposite to control systems in which the total system, including the loop, is the invention.

References

Informative references

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

Cascode amplifiers	H03F 1/22
Differential amplifiers	H03F 3/45
Resistor networks	H03H 7/24

Special rules of classification

For arrangements combined with means for generating a controlling signal, or these means per se, see other main groups of H03G.

H03G 1/0023

{in emitter-coupled or cascode amplifiers (H03G 1/0029 takes precedence)}

Definition statement

This place covers:

This is an important subgroup, including the emitter-coupled or cascode amplifiers. In these amplifiers, the gain is changed by e.g. a controlled resistor between coupled emitters.

H03G 1/0029

{using FETs}

Definition statement

This place covers:

The subgroup H03G 1/0029 takes precedence and includes the same structures as H03G 1/0023, but uses FETs instead of bipolar transistors.

H03G 1/0035

{using continuously variable impedance elements}

Definition statement

This place covers:

This subgroup includes continuously variable elements that change the gain in a continuous manner. The control signal is an analogue signal.

H03G 1/0088

{using discontinuously variable devices, e.g. switch-operated}

Definition statement

This place covers:

This subgroup includes discontinuously variable elements that change the gain. Discontinuously variable elements change the gain stepwise.

Often a digital signal controls the gain.

H03G 1/02

Remote control of amplification, tone or bandwidth (combined with remote tuning or selection of resonant circuits H03J)

References

Limiting references

This place does not cover:

Remote control combined with remote tuning or selection of resonant circuits	H03J

Informative references

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

Remote control in general	G05, G08

H03G 3/00

Gain control in amplifiers or frequency changers

Definition statement

This place covers:

The gain of amplifiers or frequency changers is controlled without distortion of the input signal. The main concept of controlling is the feedback loop from the output of the amplifier to a controlling element. Other gain control concepts are possible.

References

Informative references

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

Amplitude control for seismic recording	G01V 1/24
Modifications of amplifiers to reduce non-linear distortion	H03F 1/32
Gated amplifiers	H03F 3/72
Details of transmission systems for providing a predistortion of the signal in the transmitter and corresponding correction in the receiver	H04B 1/62, H04B 1/64
Arrangements for compensation undesirable properties of the transmission path between the modulator and demodulator using predistortion	H04L 27/367, H04L 27/368
Speech amplifiers in telephones	H04M 1/60
Gain control peculiar to television receivers	H04N
Details of television systems, automatic gain control in receiver circuitry of TVs	H04N 5/52
Hearing aids	H04R 25/00
Transmission Power control, power saving or power classes	H04W 52/00

H03G 3/001

{Digital control of analog signals}

Definition statement

This place covers:

This subgroup includes important details of the digital domain used for controlling an analogue signal; e.g. multiplying DACs.

H03G 3/002

{Control of digital or coded signals (H03G 3/3089 take precedence)}

Definition statement

This place covers:

In this subgroup, mathematical methods in the digital domain are included. In this subgroup, either the control loop is not described in the description, or parts of the amplifier are very detailed.

H03G 3/02

Manually-operated control {(H03G 3/001 and H03G 3/002 take precedence)}

Definition statement

This place covers:

In this subgroup, the amplification is manually controlled; e.g.buttons or sliders are included to be used by a person

H03G 3/20

Automatic control ({H03G 3/005 takes precedence;} combined with volume compression or expansion H03G 7/00)

Definition statement

This place covers:

The gain control in amplifiers when the control is performed with an automatic system. The main automatic concept for controlling is the feedback loop from the output of the amplifier to a controlling element.

References

Limiting references

This place does not cover:

Control by a pilot signal	H03G 3/005
Combined with volume compression or expansion	H03G 7/00

Special rules of classification

The subject matter should be classified in the subgroups H03G 3/22–H03G 3/348 as appropriate.

H03G 3/30

in amplifiers having semiconductor devices

Definition statement

This place covers:

This is a heading subgroup for the further automatic control subgroups having semiconductor devices.

This group is also used when the amplifiers are not further described and either presented in functional blocks or just obviously have semiconductor devices. Most systems are classified in the following classes

H03G 3/3005

{in amplifiers suitable for low-frequencies, e.g. audio amplifiers (H03G 3/32, H03G 3/34 take precedence)}

Definition statement

This place covers:

In this subgroup, analogue and digital audio systems are included. Digital audio systems should additionally be classified in H03G 3/3089.

H03G 3/3036

{in high-frequency amplifiers or in frequency-changers (H03G 3/3052, H03G 3/32, H03G 3/34 take precedence)}

Definition statement

This place covers:

This subgroup specially includes AGCs in high frequency amplifiers e.g., pre amplifiers

If the AGC is used in transmitters or if the AGC is used in power amplifiers, they are classified in the following sub groups.

H03G 3/3042

{in modulators, frequency-changers, transmitters or power amplifiers (transmission power control in bidirectional transmission systems H04W 52/04)}

Definition statement

This place covers:

In this subgroup many examples of controlling the gain in amplifiers in transmitters e.g. in base stations, mobile phones, WLAN, and power amplifiers are included .

H03G 3/3047

{for intermittent signals, e.g. burst signals}

Definition statement

This place covers:

Circuits to control the burst of the transmission signal.In this subgroup many examples for controlling amplifiers in transmitters e.g. in base stations, mobile phones, WLAN, and power amplifiers are included.

This subgroup is used if the burst is important for controlling the amplification.

H03G 3/3052

{in bandpass amplifiers (H.F. or I.F.) or in frequency-changers used in a (super)heterodyne receiver (H03G 3/32, H03G 3/34 take precedence)}

Definition statement

This place covers:

This subgroup is a heading subgroup for controlling the amplification of receivers and band pass amplifiers.

H03G 3/3057

{using at least one diode as controlling device}

Definition statement

This place covers:

This subgroup includes many amplifiers in RECEIVERS (mobile phones, WLAN....). This subgroup is used if especially a diode is important as controlling element.

H03G 3/3063

{using at least one transistor as controlling device, the transistor being used as a variable impedance device}

Definition statement

This place covers:

This subgroup includes many amplifiers in RECEIVERS (mobile phones, WLAN....). This subgroup is used if it is important that at least one transistor is used as controlling element.

H03G 3/3068

{Circuits generating control signals for both R.F. and I.F. stages}

Definition statement

This place covers:

This subgroup includes many amplifiers in RECEIVERS (mobile phones, WLAN....). This subgroup is used if both R.F. stages and I.F. stages are controlled.

H03G 3/3073

{Circuits generating control signals when no carrier is present, or in SSB, CW or pulse receivers}

Definition statement

This place covers:

This subgroup includes receivers. This subgroup is e.g. used if the pulse is important for controlling the gain.

H03G 3/3078

{Circuits generating control signals for digitally modulated signals}

Definition statement

This place covers:

This subgroup includes many amplifiers in RECEIVERS (mobile phones, WLAN....)

This subgroup includes most of the modern receivers, since they are based on digital modulation, e.g. OFDM.....

H03G 3/3089

{Control of digital or coded signals}

Definition statement

This place covers:

This subgroup includes many digital audio systems. Digital audio systems should additionally be classified in H03G 3/3005 or attached sub groups.

This subgroup is also used for digital hf systems.

H03G 3/32

the control being dependent upon ambient noise level or sound level

Definition statement

This place covers:

This subgroup includes many audio systems, whereby the noise signal is important for controlling the volume. These systems are often used in cars.

H03G 5/00

Tone control or bandwidth control in amplifiers

Definition statement

This place covers:

This main group mainly consists of audio amplifiers. The characteristic of an audio signal is changed, so that the sound of the signal is changed. This is the function of tone control. The second possibility is bandwidth control, which includes also the control of high frequency bandwidth.

References

Limiting references

This place does not cover:

Impedance networks, e.g. resonant circuits, resonators, frequency selective filters	H03H
Control of transmission, equalising in line transmission systems	H04B 3/04
Modulated carrier systems; equalisers for modulated carrier systems	H04L 27/01

Informative references

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

Hearing aids	H04R 25/00
Control circuits for electronic adaptation of the sound field	H04S 7/00

H03G 5/005

{of digital signals}

Definition statement

This place covers:

Modern audio systems are mostly digital systems. This subgroup mainly includes the digital tone control systems.

References

Informative references

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

Tone control or bandwidth control in amplifiers	H03G 5/00

Special rules of classification

If the system is a digital audio system, it should be additionally classified into H03G 5/16, H03G 5/165 or H03G 5/18.

H03G 5/02

Manually-operated control

Definition statement

This place covers:

This subgroup covers the manual operation of the tone control.

References

Informative references

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

Variable bandpass or bandstop filters	H03H 7/12

H03G 5/16

Automatic control

Definition statement

This place covers:

This subgroup brings the automatic feature to the tone control.

H03G 5/165

{Equalizers; Volume or gain control in limited frequency bands}

Definition statement

This place covers:

This subgroup contains equalizers. The audio signal is divided into different bands and the bands are treated separately. Digital audio equalizers should also be classified in H03G 5/005

H03G 7/00

Volume compression or expansion in amplifiers {(frequency dependent H03G 9/00)}

Definition statement

This place covers:

This main group mainly consists of audio amplifiers.

The controlling is independent of frequency. This main group includes: soft limiting, soft clipping, logarithmic amplifiers, and includes also: gain control which is linear in dB, Dolby compression.

References

Informative references

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

Logarithmic function generators	G06G 7/24
Hearing aids	H04R 25/00

H03G 7/001

{without controlling loop (H03G 7/007, H03G 7/02, H03G 7/06 take precedence)}

Definition statement

This place covers:

This subgroup includes also limiting amplifiers, logarithmic amplifiers (also high frequency amplifiers) . In this context the controlling loop from the output of the system to the amplifier is missing. This results in that no strong time delay is present in the controlling.

H03G 7/002

{in untuned or low-frequency amplifiers, e.g. audio amplifiers (H03G 7/007, H03G 7/001, H03G 7/008, H03G 7/02, H03G 7/06 take precedence)}

Definition statement

This place covers:

This subgroup mainly consists of audio amplifiers.

The controlling is independent of frequency.

This subclass also includes systems, if the audio system is only presented in the application in the form of functional blocks.

If the system is a digital audio system it should be put into H03G 7/002 and H03G 7/007

H03G 7/007

{of digital or coded signals}

Definition statement

This place covers:

Modern audio systems are mostly digital systems. This subgroup mainly includes the digital volume compression and expansion systems.

If the system is a digital audio system it should be put into H03G 7/002 and H03G 7/007

H03G 9/00

Combinations of two or more types of control, e.g. gain control and tone control

Definition statement

This place covers:

This main group mainly consists of audio amplifiers. At least two types of controlling are combined into one invention.

References

Informative references

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

Hearing aids	H04R 25/00
Control circuits for the electronic adaptation of the sound field	H04S 7/00

H03G 9/005

{of digital or coded signals}

Definition statement

This place covers:

Modern audio systems are mostly digital systems. This subgroup includes the digital systems in which at least two types of controlling are combined into one invention.

This subgroup contains many psycho-acoustic systems.

H03G 9/02

in untuned amplifiers

Definition statement

This place covers:

This subgroup mainly consists of audio amplifiers. At least two types of controlling are combined into one invention.

This subclass also includes applications, where the audio system is only presented in the application in the form of functional blocks.

References

Informative references

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

Combined tone controls for low and high frequencies	H03G 5/00
Volume compression or expansion in amplifiers	H03G 7/00

H03G 9/025

{frequency-dependent volume compression or expansion, e.g. multiple-band systems (H03G 9/10, H03G 9/18 take precedence)}

Definition statement

This place covers:

This sub group mainly consists of audio amplifiers. This subgroup contains frequency-dependent volume compression or expansion.

This subclass also includes applications, where the audio system is only presented in the application in the form of functional blocks.

This subgroup includes many psycho-acoustic systems.

H03G 9/26

in untuned amplifying stages as well as in frequency-selective amplifying stages

References

Informative references

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

Gain control in unturned amplifying stages as well as in frequency-selective amplifying stages	H03G 3/00
Tone control or bandwidth control	H03G 5/00
Volume compression or expansion in amplifiers	H03G 7/00

H03G 11/00

Limiting amplitude; Limiting rate of change of amplitude {; Clipping in general}

Definition statement

This place covers:

This main group covers clipping systems. Clipping is defined to include a hard cut. If the amplitude is limited in a soft way, this is defined to be compression. Compression is classified in H03G 7/00 groups. Also soft clipping is classified in H03G 7/00 groups. The soft clipping is defined to be a form of compression.

References

Limiting references

This place does not cover:

Volume/level/amplitude compression	H03G 7/00

H03G 11/002

{without controlling loop (H03G 11/004, H03G 11/006, H03G 11/008, H03G 11/02, H03G 11/04, H03G 11/06, H03G 11/08 take precedence)}

Definition statement

This place covers:

This subgroup includes clipping systems without feedback loop. As no feedback loop is used, the systems have no delays, and no over swinging.

References

Limiting references

This place does not cover:

Using discharge tubes	H03G 11/004
In circuits having distributed constants	H03G 11/006
Of digital or coded signals	H03G 11/008
By means of diodes	H03G 11/02
Limiting level dependent on strength of signal	H03G 11/04
Limiters of angle-modulated signals	H03G 11/06
Limiting rate of change of amplitude	H03G 11/08

H03G 11/008

{of digital or coded signals}

Definition statement

This place covers:

Modern audio systems are mostly digital systems. This subgroup includes the digital systems which clip the audio signal in a hard way.

References

Informative references

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

By means of diodes	H03G 11/02

H03G 11/02

by means of diodes ({H03G 11/008, } H03G 11/04, H03G 11/06, H03G 11/08 take precedence)

Definition statement

This place covers:

This subgroup includes inventions where the diode is the important element for clipping.

H03G 11/04

Limiting level dependent on strength of signal; Limiting level dependent on strength of carrier on which signal is modulated {(H03G 11/008 takes precedence)}

Definition statement

This place covers:

This subgroup includes inventions where the strength of a signal is the important factor to define the clipping level.

H03G 11/08

Limiting rate of change of amplitude {(H03G 11/008 takes precedence)}

Definition statement

This place covers:

This subgroup includes inventions where the rate of change of a signal is limited.

H03G 99/00

Subject matter not provided for in other groups of this subclass

Definition statement

This place covers:

Control of amplification not covered elsewhere in H03G.

H03G 1/00 contains details of the arrangement for controlling.

H03G 99/00 is defined to include applications which could not be placed in an other main /subgroup. This main group is mainly created for organizational reasons. Usually it should be empty.

References

References out of a residual place

Examples of places in relation to which this place is residual:

Details of arrangements for controlling amplification	H03G 1/00
Gain control in amplifiers or frequency changers	H03G 3/00
Tone control or bandwidth control in amplifiers	H03G 5/00
Volume compression or expansion in amplifiers	H03G 7/00

Combinations of two or more types of control, e.g. gain control and tone control	H03G 9/00
Limiting amplitude; Limiting rate of change of amplitude	H03G 11/00