CPC NOTICE OF CHANGES 533

DATE: JANURARY 1, 2018

PROJECT MP0149

The following classification changes will be effected by this Notice of Changes:

Action*	Subclass	Group(s)
SCHEME:		
Titles Changed:	H03M	1/002, 1/0639, 1/0656, 1/0695, 1/0827, 1/12, 1/122, 1/124, 1/125, 1/245, 1/301, 1/36, 1/50, 1/66
	H03M	3/04, 3/354, 3/382, 3/494, 3/508
	H03M	7/00, 7/005, 7/20, 7/30, 7/3015, 7/6094, 7/707
	H03M	11/24
	H03M	13/00, 13/09, 13/158, 13/2975, 13/33, 13/3905, 13/42, 13/6306, 13/6575
Warnings Deleted:	H03M	13/015, 13/07, 13/09, 13/132, 13/1505, 13/1515, 13/159, 13/175, 13/19, 13/235, 13/2903, 13/2909, 13/2933, 13/333, 13/353, 13/3707, 13/3944, 13/451, 13/61, 2201/00
Notes Deleted:	H03M	7/008, 2201/00
Notes New:	H03M	1/00, 7/3002, 11/00
Notes Modified:	H03M	3/30, 5/00, 7/00, 2201/80,7/00
DEFINITIONS:		
Definitions New:	H03M	1/002, 1/02, 1/04, 1/0639, 1/12, 1/1235, 1/36, 1/124, 1/245, 1/301, 1/42, 1/44, 1/48, 1/66, 1/50, 1/644, 1/668, 1/78
	H03M	3/04, 3/354, 3/382, 3/508
	H03M	7/20, 7/26, 7/3044
	H03M	13/09, 13/158, 13/2975, 13/3905
Definitions Modified:	H03M	1/00, 3/00, 5/00, 7/00

No other subclasses/groups are impacted by this Notice of Changes.

This Notice of Changes includes the following *[Check the ones included]:*

1. CLASSIFICATION SCHEME CHANGES

    ☒   A. New, Modified or Deleted Group(s)

    ☒   B. New, Modified or Deleted Warning(s)

    ☒   C. New, Modified or Deleted Note(s)

    ☐   D. New, Modified or Deleted Guidance Heading(s)

2. DEFINITIONS

    ☒ A. New or Modified Definitions (Full definition template)

    ☐ B. Modified or Deleted Definitions (Definitions Quick Fix)

3. ☐ REVISION CONCORDANCE LIST (RCL)

4. ☒ CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

5. ☐ CHANGES TO THE CROSS-REFERENCE LIST (CRL)

1. CLASSIFICATION SCHEME CHANGES

    A. New, Modified or Deleted Group(s)

SUBCLASS H03M - CODING; DECODING; CODE CONVERSION IN GENERAL (using fluidic means F15C4/00; optical analogue/digital converters G02F7/00; coding, decoding or code conversion, specially adapted for particular applications, see the relevant subclasses, e.g. G01D, G01R, G06F, G06T, G09G, G10L, G11B, G11C, H04B, H04L, H04M, H04N; ciphering or deciphering for cryptography or other purposes involving the need for secrecy G09C)

Type*	Symbol	Indent Level Number of dots (e.g. 0, 1, 2)	Title (new or modified) "CPC only" text should normally be enclosed in {curly brackets}**	Transferred to#
M	H03M1/002	1	{Provisions or arrangements for saving power, e.g. by allowing a sleep mode, using lower supply voltage for downstream stages, using multiple clock domains or by selectively turning on stages when needed}	
M	H03M1/0639	5	{using dither, e.g. using triangular or sawtooth waveforms (for increasing resolution H03M1/201)}	
M	H03M1/0656	4	{in the time domain, e.g. using intended jitter as a dither signal}	
M	H03M1/0695	5	{using less than the maximum number of output states per stage or step, e.g. 1.5 per stage or less than 1.5 bit per stage type}	
M	H03M1/0827	3	{of electromagnetic or electrostatic field noise, e.g. preventing crosstalk by shielding or optical isolation}	
M	H03M1/12	1	Analogue/digital converters ({H03M1/001-} H03M1/10 take precedence)	
M	H03M1/122	3	{Shared using a single converter or a part thereof for multiple channels, e.g. a residue amplifier for multiple stages}	
M	H03M1/124	2	{Sampling or signal conditioning arrangements specially adapted for A/D converters}	
M	H03M1/125	4	{Asynchronous, i.e. free-running operation within each conversion cycle}	
M	H03M1/245	4	{Constructional details of parts relevant to the encoding mechanism, e.g. pattern carriers, pattern sensors}	

Type*	Symbol	Indent Level Number of dots (e.g. 0, 1, 2)	Title (new or modified) "CPC only" text should normally be enclosed in {curly brackets}**	Transferred to#
M	H03M1/301	6	{Constructional details of parts relevant to the encoding mechanism, e.g. pattern carriers, pattern sensors}	
M	H03M 1/36	3	simultaneously only, i.e. parallel type	
M	H03M1/50	2	with intermediate conversion to time interval (H03M1/64 takes precedence)	
M	H03M 1/66	1	Digital/analogue converters ({H03M1/001-} H03M1/10 take precedence)	
M	H03M 3/04	1	Differential modulation with several bits {, e.g. differential pulse code modulation [DPCM] (H03M3/30 takes precedence)}	
M	H03M3/354	4	{at one point, i.e. by adjusting a single reference value, e.g. bias or gain error}	
M	H03M3/382	3	{at one point of the transfer characteristic, i.e. by adjusting a single reference value, e.g. bias or gain error}	
M	H03M3/494	3	{Sampling or signal conditioning arrangements specially adapted for delta-sigma type analogue/digital conversion systems}	
M	H03M3/508	3	{Details relating to the interpolation process}	
M	H03M 7/00	0	Conversion of a code where information is represented by a given sequence or number of digits to a code where the same {, similar or subset of} information is represented by a different sequence or number of digits	
M	H03M7/005	2	{using semiconductor devices}	
M	H03M 7/20	2	Conversion to or from n-out-of-m codes	
M	H03M 7/30	1	Compression (speech analysis-synthesis for redundancy reduction G10L19/00; for image communication H04N); Expansion; Suppression of unnecessary data, e.g. redundancy reduction	
M	H03M7/3015	4	{Structural details of digital delta-sigma modulators}	
M	H03M7/6094	5	{according to reasons other than compression rate or data type}	
M	H03M7/707	3	{Structured documents, e.g. XML}	
M	H03M11/24	2	using analogue means {, e.g. by coding the states of multiple switches into a single multi-level analogue signal or by indicating the type of a device using the voltage level at a specific tap of a resistive divider}	

Type*	Symbol	Indent Level Number of dots (e.g. 0, 1, 2)	Title (new or modified) "CPC only" text should normally be enclosed in {curly brackets}**	Transferred to#
M	H03M 13/00	0	Coding, decoding or code conversion, for error detection or error correction; Coding theory basic assumptions; Coding bounds; Error probability evaluation methods; Channel models; Simulation or testing of codes (error detection or error correction for analogue/digital, digital/analogue or code conversion H03M 1/00 – H03M 11/00 specially adapted for digital computers G06F 11/08, for information storage based on relative movement between record carrier and transducer G11B, e.g. G11B 20/18, for static stores G11C)	
M	H03M 13/09	3	Error detection only, e.g. using cyclic redundancy check [CRC] codes or single parity bit	
M	H03M 13/158	6	{Finite field arithmetic processing}	
M	H03M 13/2975	3	{Judging correct decoding, e.g. iteration stopping criteria}	
M	H03M 13/33	1	Synchronisation based on error coding or decoding	
M	H03M 13/3905	3	{Maximum a posteriori probability [MAP] decoding or approximations thereof based on trellis or lattice decoding, e.g. forward-backward algorithm, log-MAP decoding, max-log-MAP decoding}	
M	H03M 13/42	3	{MAP decoding or approximations thereof based on trellis or lattice decoding, e.g. forward-backward algorithm, log-MAP decoding, max-log-MAP decoding}	
M	H03M 13/6306	2	{Error control coding in combination with Automatic Repeat reQuest [ARQ] and diversity transmission, e.g. coding schemes for the multiple transmission of the same information or the transmission of incremental redundancy (H03M 13/3761, H03M 13/3769 and H03M 13/635 take precedence)}	
M	H03M 13/6575	2	{Implementations based on combinatorial logic, e.g. Boolean circuits}	

*N = new entries where reclassification into entries is involved; C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; E= existing entries with enlarged file scope, which receive documents from C or D entries, e.g. when a limiting reference is removed from the entry title; M = entries with no change to the file scope (no

reclassification); D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed; U = entries that are unchanged.

NOTES:
- **No {curly brackets} are used for titles in CPC only <u>subclasses</u>, e.g. C12Y, A23Y; 2000 series symbol titles of groups found at the end of schemes (orthogonal codes); or the Y section titles. The {curly brackets} <u>are</u> used for 2000 series symbol titles found interspersed throughout the main trunk schemes (breakdown codes).
- For U groups, the minimum requirement is to include the U group located immediately prior to the N group or N group array, in order to show the N group hierarchy and improve the readability and understanding of the scheme. Always include the symbol, indent level and title of the U group in the table above.
- All entry types should be included in the scheme changes table above for better understanding of the overall scheme change picture. Symbol, indent level, and title are required for all types except "D" which requires only a symbol.
- #"Transferred to" column <u>must</u> be completed for all C, D, F, and Q type entries. F groups will be deleted once reclassification is completed.
- When multiple symbols are included in the "Transferred to" column, avoid using ranges of symbols in order to be as precise as possible.
- For administrative transfer of documents, the following text should be used: "< administrative transfer to XX>" or "<administrative transfer to XX and YY simultaneously>" when administrative transfer of the same documents is to more than one place.
- Administrative transfer to main trunk groups is assumed to be "invention information", unless otherwise indicated, and to 2000 series groups is assumed to be "additional information".

B.   New, Modified or Deleted Warning notice(s)

SUBCLASS H03M - CODING; DECODING; CODE CONVERSION IN GENERAL   (using fluidic means F15C4/00 ; optical analogue/digital converters G02F7/00 ; coding, decoding or code conversion, specially adapted for particular applications, see the relevant subclasses, e.g. G01D, G01R, G06F, G06T, G09G, G10L, G11B, G11C, H04B, H04L, H04M, H04N; ciphering or deciphering for cryptography or other purposes involving the need for secrecy G09C)

Type*	Location	Old Warning notice	New/Modified Warning notice
D	H03M13/015	H03M13/015 and H03M13/036 are not complete, see provisionally also H03M13/01	
D	H03M13/07	Not complete, see also G06F11/104	
D	H03M13/09	Not complete, see also G06F11/10B	
D	H03M13/132	H03M13/132 - H03M13/138 are not complete, see provisionally also H03M 13/13	
D	H03M13/1505	H03M 13/1505 is not complete, see provisionally also H03M13/15]	
D	H03M13/1515	H03M13/1515 - H03M13/1585 are not complete, see provisionally also H03M13/15	
D	H03M13/159	H03M13/159 and H03M13/1595 are not complete, see provisionally also H03M13/15	
D	H03M13/175	H03M13/175 is not complete, see provisionally also H03M13/17	
D	H03M 13/19	Not complete, see also G06F11/1008	
D	H03M13/235	H03M13/235 is not complete, see provisionally also H03M13/23	
D	H03M13/2903	H03M13/2903 is not complete, see provisionally also H03M13/29	
D	H03M13/2909	H03M13/2909 - H03M13/293 are not complete, see provisionally also H03M13/29	
D	H03M13/2933	H03M13/2933 - H03M13/2954 are not complete, see provisionally also H03M13/29	

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Type*	Location	Old Warning notice	New/Modified Warning notice
D	H03M 13/333	H03M13/333 - H03M13/336 are not complete, see provisionally also H03M13/33	
D	H03M 13/353	H03M13/353 and H03M13/356 are not complete, see provisionally also H03M13/35	
D	H03M 13/3707	H03M13/3707 - H03M13/3792 are not complete, see provisionally also H03M13/37	
D	H03M 13/3944	H03M13/3944 - H03M13/3994 are not complete, see provisionally also H03M13/39	
D	H03M 13/451	H03M13/451 - H03M13/458 are not complete, see provisionally also H03M13/45	
D	H03M 13/61	H03M 13/61 - H03M13/6597 are not complete, see provisionally also H03M13/61 , H03M13/63 and H03M13/65	
D	H03M 2201/00	The use of this indexing scheme has been discontinued for all documents published later than 1989.	

*N = new warning, M = modified warning, D = deleted warning

NOTE: The "Location" column only requires the symbol PRIOR to the location of the warning. No further directions such as "before" or "after" are required.

C. <u>New, Modified or Deleted Note(s)</u>

SUBCLASS H03M - CODING; DECODING; CODE CONVERSION IN GENERAL (using fluidic means F15C4/00 ; optical analogue/digital converters G02F7/00 ; coding, decoding or code conversion, specially adapted for particular applications, see the relevant subclasses, e.g. G01D, G01R, G06F, G06T, G09G, G10L, G11B, G11C, H04B, H04L, H04M, H04N; ciphering or deciphering for cryptography or other purposes involving the need for secrecy G09C)

<u>Type*</u>	<u>Location</u>	<u>Old Note</u>	<u>New/Modified Note</u>
N	H03M1/00		(1){Documents published prior to 1990 have been classified using the indexing scheme of group H03M2201/00; these documents have not been classified in groups H03M1/001 - H03M1/88.} (2) {In this main group, additional information has been classified systematically for documents published from 01-01-1990 on.}
M	H03M3/30	In this group branch, in the absence of an indication of the contrary, classification is made in the first appropriate place	{In group branch H03M3/30, in the absence of an indication to the contrary, classification is made in the first appropriate place.}
M	H03M5/00	In groups H03M5/02 to H03M5/22, in the absence of an indication to the contrary, an invention is classified in the last appropriate place.	In groups H03M5/02 - H03M5/22, in the absence of an indication to the contrary, an invention is classified in the last appropriate place. {In this main group, additional information has been classified systematically for documents published from 01-04-2004 onwards.}
M	H03M7/00	In groups H03M 7/001 - H03M 7/50, the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.	Add to existing Note: In groups H03M 7/02 – H03M 7/50, in the absence of an indication to the contrary, an invention is classified in the last appropriate place. {In this main group, in the absence of an indication to the contrary, additional information has been classified systematically for documents published from 01-04-2004 onwards.}
N	H03M7/3002		{In group branch H03M7/3002, additional information has been systematically classified for all documents.}

Type*	Location	Old Note	New/Modified Note
N	H03M 11/00		{In this main group, additional information has been classified systematically for documents published from 01-01-2013 onwards.}
D	H03M 2201/00	**NOTE** As this scheme is obtained by conversion from the former deep indexing system RM03 it reflects the several editions of that system in the following way: – code symbols added at subsequent editions are indicated by numbers [2] or [3] in square brackets, the code symbols present from the first edition on having no indication; – headers which did not have a code symbol in the RM03 system and thus could not be assigned to documents, but which need a code symbol in the ICO system for the purpose of a correct hierarchical order, are indicated by the symbol [H]; – the edition according to which a document has been indexed is indicated by the assignment of one of code symbols H03M 2201/01 through H03M 2201/03 to that document. In principle, therefore, a search should include a separate combination of appropriate code symbols for each edition, each combination including one of codes H03M 2201/01 through H03M 2201/03. On an incidental base, however, code symbols from later editions have been assigned to documents indexed according to an earlier edition.	
M	H03M 2201/80	The codes of this subgroup should be assigned only insofar as the component, circuit or device concerned is not usual for the type of converter concerned, e.g.	The indexing codes of group branch H03M 2201/80 have been allocated only insofar as the component, circuit or device concerned is not usual for the type

Type*	Location	Old Note	New/Modified Note
		an intermediate time interval type A/D converter usually has a counter which therefore need not be indexed in this subgroup.	of converter concerned, e.g. an intermediate time interval type A/D converter usually has a counter which, therefore, has not separately been indexed in this group branch.

*N = new note, M = modified note, D = deleted note

NOTE: The "Location" column only requires the symbol PRIOR to the location of the note. No further directions such as "before" or "after" are required.

2. A. DEFINITIONS

H03M 1/00 (modified)

Definition statement

Delete: From the Definition statement section, **after** the bulleted list, **ALL of the paragraphs and graphics to the end** of the Definition statement section.

Limiting references

Delete: ALL of the rows in the Limiting references table, except for the first row shown below.

A/D or D/A conversion using differential modulation	H03M 3/00

Informative references

Insert: The following new rows in the existing Informative references table.

Digital delta-sigma modulators per se	H03M 7/3002
A/D or D/A converters using fluidic means (e.g. pneumatic, hydraulic)	F15C 4/00
Time-to-digital converters	G04F 10/005
Current or voltage sources	G05F 3/00
Digital pulse width modulators per se, i.e. resulting in a discrete PWM signal	G06F 1/025, H03M 5/08
Interfacing or handshaking between A/D or D/A converters on the one hand and computers on the other hand	G06F 3/05
Comparators : for comparing digital (multi-bit) signals for comparing logic signals for comparing analogue signals	G06F 7/02, H03K 3/00, H03K 5/24
A/D or D/A converters performing calculations (i.e. on two or more input signals)	G06J 1/00
Transmission of measurement or control data	G08C
S/H circuits in general	G11C 27/02

Chip layout of an array of impedances, current sources, switches etc.	H01L 27/00, H01L 29/00
Operational amplifiers	H03F
Sample rate conversion	H03H 17/0416, H03H 17/0621
Analogue pulse width modulators per se	H03K 7/08
Multiplexers per se	H03K 17/00
Multiplex transmission systems	H04J
Pulse-shaping in general	H04L 25/03
DC level restoring in general in television receivers	H04L 25/06, H04N 5/18

Special rules of classification

Insert: The following new bulleted statements, in the Special rules of classification section, after the last existing statement: "For the search…in this group from 01-01-1990 onwards".

- Documents published prior to 1990 have been classified using deep-indexing scheme H03M 2201/00, which was derived from an older, non-IPC-based deep-indexing scheme (ICIREPAT scheme RM03) and for these documents replaces the use of subgroups H03M1/001 through H03M 1/88. All these documents have main group symbol H03M 1/00 as the mandatory but - for search purposes - dummy EC classification symbol.
- Since indexing scheme H03M 2201/00 has been closed, it should not be used for classifying new documents.
- For the search in these documents, it is noted that, as this scheme is obtained by conversion from said deep indexing system RM03, it reflects the three disjunct editions of that system in the following way: Code symbols added or amended in subsequent editions are indicated by numbers [2] or [3] in square brackets, the code symbols present from the first edition on having no indication; headers which did not have a code symbol in the RM03 system and thus could not be assigned to documents, but which need a code symbol in the Indexing Code system for the purpose of a correct hierarchical order, are indicated by the symbol [H]; the edition according to which a particular document has been indexed is indicated by the assignment of one of code symbols H03M 2201/01 - H03M 2201/03 to that document.

In principle, therefore, a search should include a separate combination of appropriate code symbols for each edition, each combination including one of codes H03M2201/01 through H03M2201/03. On an incidental base, however, code symbols from later editions have been allocated to documents indexed according to an earlier edition.

H03M 1/002 (new)

Definition statement

This place covers:

This group deals with the provision of special means for saving power, e.g. for allowing a sleep mode.

Special rules of classification

Thus the group should not be used for overall designs using less power than prior ones.

H03M 1/02 (new)

Definition statement

This place covers:

This group covers converters which are truly reconfigurable between A/D and D/A conversion as well as CODEC's having separate A/D and D/A converters with at least partially common control.

H03M 1/04 (new)

Definition statement

This place covers:

converters in which the conversion process as such has a stochastical nature or which convert the analogue or digital signal to a (possibly intermediate) signal in which the information content is represented by stochastic parameters.

It does not cover the use of dither or the random selection among identical elements for averaging out errors.

References

Informative references

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

Signal in which the information content is represented by stochastic parameters used for calculations	G06F 7/70

H03M 1/0639 (new)

References

Limiting References

This group does not cover:

Using dither for increasing resolution	H03M 1/201

H03M 1/12 (new)

Special rules of classification

H03M 1/001 - H03M 1/10 take precedence.

H03M 1/1235 (new)

References

References out of a residual place

Places in relation to which this group is residual:

This group is residual to A/D converters having an intentionally non-linear transfer characteristic and not falling within the scope of anyone of groups	H03M 1/367, H03M 1/464, H03M 1/58, H03M 1/62.

H03M 1/124 (new)

References

Informative references

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

S/H circuits	G11C 27/02
Sample rate conversion	H03H 17/0416, H03H 17/0621

H03M 1/245 (new)

References

Informative references

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

Details of housings, casings or the like	G01, H01, H05

H03M 1/301 (new)

References

Informative references

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

Details of housings, casings or the like	G01, H01, H05

H03M 1/36 (new)

References

Informative references

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

Asynchronous serial converters	H03M 1/42
Thermometer to binary encoders	H03M 7/165

Special rules of classification

It is noted that some patent documents deal with converters stated by the inventor to be "parallel converters using n comparators for n bits" or similar but in which in fact the reference values of the second and further comparators are modified according to the

outputs of one or more preceding comparators. Thus, in reality these converters are not parallel but asynchronous serial converters falling within the scope of H03M 1/42.
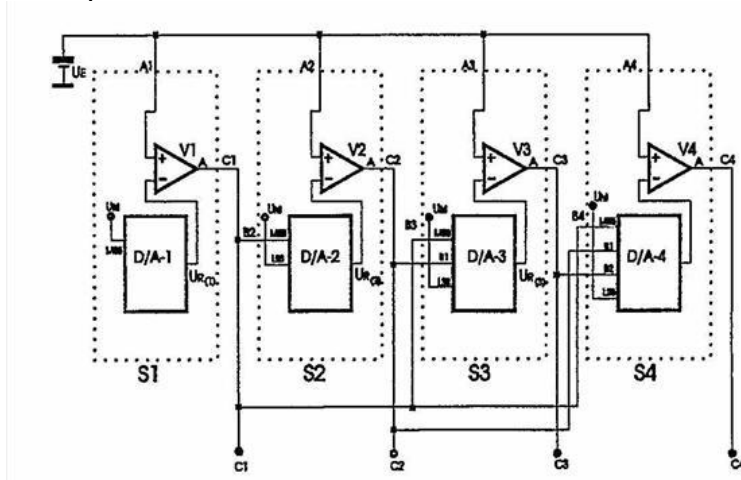
H03M 1/42 (new)

Definition statement
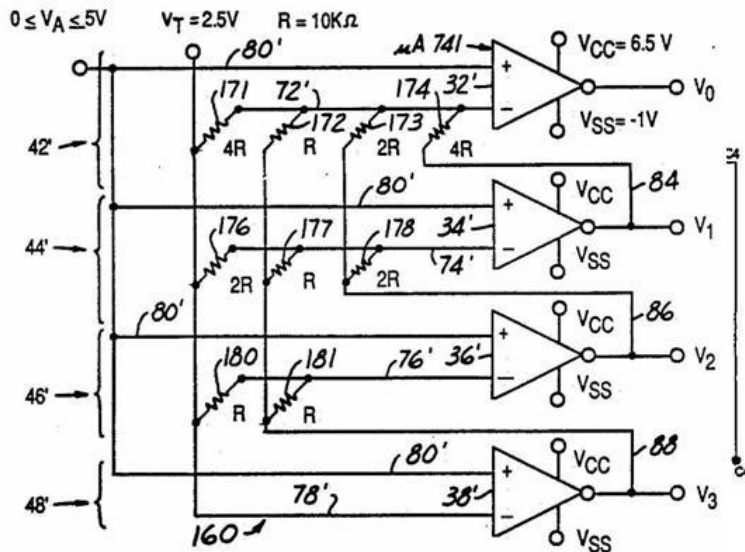
This place covers:

Multiple stage A/D converters in which the input signal is broadcasted to all stages while the reference value applied to each stage but the first one is modified by the output of one or more preceding stages.

Examples:

H03M 1/44 (new)

Definition statement

This place covers:

Multiple stage A/D converters in which the input signal is broadcasted to all stages while the reference value applied to each stage but the first one is modified by the output of one or more preceding stages.

H03M 1/48 (new)

Definition statement

This place covers:

A/D converters in which the output signal continuously tracks the input signal by means of reconversion of the output signal to an analogue feedback signal which is compared to the input signal.

The error signal usually adjusts the digital generator in one or the other direction, in dependence upon the sign of the error, in order to reach the correct position along the

shortest route. However, occasionally the digital generator can be adjusted in one direction only; then it has to move circularly through nearly a full cycle in order to obtain a change in the other direction.

Relationship between large subject matter areas

It is difficult sometimes to distinguish the latter systems from the range sweeping type (H03M1/56) in which, however, the digital generator returns to a datum position between successive conversions.

The "successive approximation" type converters (H03M1/46) are sometimes called "feedback converters" as well but are also reset between conversions.

Also, it is sometimes difficult to distinguish servo-type converters from A/D converters using differential modulation (H03M3/00) which, however, deliver an output signal having a reduced number of bits at an oversampling rate, thus needing a decimation filter for converting it to a final result at full resolution and Nyquist rate.
General analogue servo-systems using only digital feedback, for example as shown in the following block diagram, do, strictly spoken, not fall within the definition of an A/D conversion system.

However, they are very similar to an A/D conversion system using a D/A converter in a feedback arrangement (output Y instead of X) and therefore these systems are classified in H03M1/48 unless the converters are merely shown as black boxes.
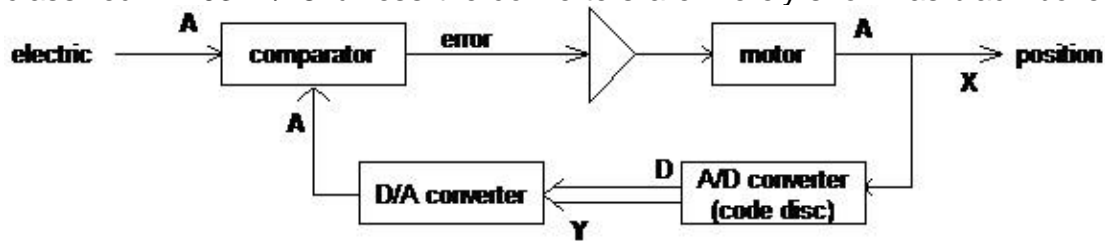
H03M-0003.jpg

H03M 1/50 (new)

References

Limiting References

This group does not cover:

Analogue/digital converters with intermediate conversion to phase of sinusoidal or similar periodical signals	H03M 1/64

Informative references

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

Time-to-digital converters	G04F 10/005

H03M 1/66 (new)

Special rules of classification

H03M 1/001 - H03M 1/10 take precedence.

H03M 1/668 (new)

Definition statement

This place covers:

D/A converters in which the output signal continuously tracks the input signal by means of reconversion of the output signal to an digital feedback signal which is compared to the input signal.

The error signal usually adjusts the analogue generator in one or the other direction, in dependence upon the sign of the error, in order to reach the correct position along the shortest route. However, occasionally the analogue generator can be adjusted in one direction only; then it has to move circularly through nearly a full cycle in order to obtain a change in the other direction. It is difficult sometimes to distinguish the latter systems from the range sweeping type (H03M 1/82) in which, however, the analogue generator returns to a datum position between successive conversions.

H03M 1/78 (new)

Definition statement

This place covers:

Networks comprising impedances in series as well as parallel branches.

References

Informative references

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

Networks having impedances in series branches only	H03M 1/76
Networks having impedances in parallel branches only	H03M 1/80

H03M 3/00 (modified)

Delete**:**   The entire Limiting references section.

Limiting references

This place does not cover:

Digital delta-sigma modulators	H03M 7/3002

Informative references

<u>Insert</u>:   The following <u>new</u> row in the existing Informative references table.

Digital delta-sigma modulators	H03M 7/3002

H03M 3/04 (new)

References

Limiting References

This place does not cover:

Delta-sigma modulation	H03M 3/30

Informative references

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

Voice coding	G10L19/00
Image coding	H04N 19/00

H03M 3/354 (new)

References

Informative references

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

Gain setting for range control	H03M 3/478

H03M 3/382 (new)

References

Informative references

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

Gain setting for range control	H03M 3/478

H03M 3/494 (new)

References

Informative references

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

Sample/hold circuits	G11C 27/02
Sample rate conversion	H03H 17/0416, H03H 17/0621

H03M 3/508 (new)

References

Informative references

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

Interpolation filters in general	H03H 17/0416, H03H 17/0621

H03M 5/00 (modified)

Definition statement

Delete: The following text from the Definition statement section.

> Further information:
> H03M 5/14
> This group covers run-length coding, i.e. codes with run-length
> constraints

References

Delete: The existing Limiting references section shown below.

Limiting references

This place does not cover.

A/D or D/A conversion	H03M 1/00
Differential modulation	H03M 3/00, H03M 7/3002

Insert: The following new Informative references section.

Informative references

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

for search:

A/D or D/A conversion	H03M 1/00
Differential modulation	H03M 3/00, H03M 7/3002

Special rules of classification

Replace: In the Special rules of classification section, the words: "ECLA code" with "CPC Symbol".

H03M 7/00 (modified)

Definition statement

Delete: In the Definition statement section, all of the text shown below.

Further information:

H03M 7/26

This subgroup deals solely with data compression and is not to be used for run-length-limited modulation techniques.

H03M 7/30

This group branch in general deals with all types of data compression unless the data compression is specified merely as a "black box". It also deals with precoding before the actual compression stage in order to get better compression results (e.g. Burrows-Wheeler transform).

H03M 7/3002

This group branch deals with digital differential modulation, e.g. delta modulation [DM], differential pulse code modulation [DPCM], delta-sigma modulation [DSM], and replaces IPC subgroups H03M7/32 - H03M7/38.

Delete: The entire existing Limiting references section.

Audio coding	G10L 19/00
Video coding	H04N 19/00

Informative references

Insert: The following new row in the Informative references table.

Audio coding	G10L19/00

Special rules of classification

Insert: The following paragraphs in the Special rules of classification section,

under the last bulleted statement.

Further information:

H03M 7/26
This subgroup deals solely with data compression and is not to be used for run-length-limited modulation techniques.

H03M 7/30
This group branch in general deals with all types of data compression unless the data compression is specified merely as a "black box". It also deals with precoding before the actual compression stage in order to get better compression results (e.g. Burrows-Wheeler transform).

H03M 7/3002
This group branch deals with digital differential modulation, e.g. delta modulation [DM], differential pulse code modulation [DPCM], delta-sigma modulation [DSM], and replaces IPC subgroups H03M7/32 - H03M7/38.

H03M 7/20 (new)

References

Informative references

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

Number-of-one counters	G06F 7/607

H03M 7/26 (new)

Definition statement

This place covers:

This subgroup deals solely with data compression and is not to be used for run-length-limited modulation techniques.

H03M 7/30 (new)

Definition statement

This place covers:

All types of data compression unless the data compression is specified merely as a "black box". It also deals with precoding before the actual compression stage in order to get better compression results, e.g. Burrows-Wheeler transform.

References

Limiting References

This place does not cover:

Speech analysis-synthesis for redundancy reduction	G10L 19/00
Speech analysis-synthesis for image communication	H04N

Informative references

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

Data acquisition	G06F 17/40
Image data processing	G06T 9/00
Redundancy reduction in data recording	G11B 20/14
Transmission	H04B 1/66

H03M 7/3044 (new)

References

Limiting References

This place does not cover:

Digital delta-sigma modulation	H03M 7/3004
Speech analysis-synthesis for redundancy reduction	G10L 19/00
Speech analysis-synthesis for image communication	H04N 19/00

Informative references

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

| Image data processing | G06T 9/00 |

H03M 13/00 (modified)

Definition statement

Delete: All of the text, beginning with: "Further information:" until the
              end of the Definition statement, including any images.

Limiting references

Insert: In the existing Limiting references table, the following new six rows.

Error detection or error correction for analogue/digital, digital analogue or code conversion	H03M 1/00-H03M 11/00
Specially Adapted for digital computers	G06F 11/08
Information storage based on relative movement between record carrier and transducer	G03B
Static stores	G11C
Error detection or Error correction in transmission systems	H04L 1/004
Television Systems	H04N 7/0357

Delete: From the existing Limiting references table, the following four rows.

Space-time coding	H04L1/00
Coding/decoding for MIMO systems	H04L1/00
Automatic repeat request schemes	H04L1/00
Network coding	H04L1/00

Special rules of classification

Insert: <u>Under</u> the last paragraph (For the search…onwards.) in the Special rules of classification section, the following <u>new text and image</u>.

Further information:

It follows a brief explanation of those ECLA subgroups, where it might not be clear from the wording alone what technical features are meant to fall within their scope:

H03M13/005

- denotes punctured codes in general when no particular details about puncturing are provided
- subgroup H03M13/6362 should be used for documents that disclose particular details regarding a strategy/scheme for rate matching by puncturing that extends beyond the mere use of punctured codes

- H03M13/6368 H03M13/6393 should be used when a particular type of puncturing is used, viz. rate compatible or complementary puncturing

H03M13/033

- this subgroup covers methods for the construction of codes, wherein the generic term construction covers the design of generator and parity-check matrices, the design of generator polynomials, the design of mapping schemes, the design of puncturing schemes etc.
- if the design includes a computer search or a random component with subsequent optimisation, then the subgroup H03M13/033 shall be allocated

H03M13/091

- this subgroup covers the calculation of CRCs (either during encoding or decoding) when the calculation is performed in a parallel or partly parallel manner, e.g. by 8 or 32 bit parallel processing
- in contrast to partly parallel or parallel processing, there is serial processing in which a CRC is calculated 1 bit by 1 bit as it is done with a conventional linear feed-back shift register

H03M13/093

- in some applications a CRC is calculated over an information word of n bits
- during transmission over a plurality of hops, the information word may be updated, e.g. some bits in the header are changed, which requires a recalculation of the CRC
- methods that do not fully recalculate the CRC but update the CRC only in respect to the changes of the information word (by exploitation of the linearity of the CRC code) are to be classified here

H03M13/1114

- known in the literature as "Memory-Aware Decoder Architectures" and "Merged-Schedule Message-Passing (MSMP) algorithm"
- see XP011104612 page 980, Section C for a detailed description
- the memory efficiency is mainly due to eliminating the storage required to save every bit-to-check messages or check-to-bit messages as in the standard message passing decoding algorithm

H03M13/1131

- scheduling is the order in which the messages of the graph should be propagated
- the "classical" scheduling is the so-called flooding schedule, where all nodes of one class, e.g. all messages send from bit nodes to check nodes, are updated before the nodes of the other class, e.g. all messages send from variable nodes to check nodes, are updated; this can be done one node at a time (serially) or in parallel.
- full parallel flooding schedule processing should be classified under H03M13/1134 (Remark: any full parallel schedule is implicitly a flooding schedule) and partly parallel flooding schedule processing under H03M13/1137
- note that serial flooding schedules are not explicitly classified
- the "shuffled" scheduling mixes check node and variable node processing, e.g. check node processing of some check nodes is started before all variable nodes have been updated; this again can be performed serially, i.e. one node after the other, or partly-parallel, i.e. several nodes in parallel.
- serial "shuffled" scheduling should solely be classified under H03M13/114.
- partly-parallel "shuffled" scheduling should be classified under H03M13/1137 and H03M13/114.

H03M13/155

- only for shortened or extended codes that fit into H03M13/151; these codes include in particular Reed-Solomon and BCH codes
- code shortening or extension for codes other than that, i.e. for codes that are not associated with error location and error correction polynomials, are to be classified under H03M13/618; these codes include, for instance, Hamming codes or LDPC codes

H03M13/1555

- decoder implementations that comprise a set of data processing elements connected in series, so that the output of one element is the input of the next one and so that the elements of a pipeline are often executed in parallel or in time-sliced fashion
- for instance, Reed-Solomon decoders are often implemented using a pipeline with 3 stages for syndrome calculation, calculation of the error locator polynomial and Chien search; cf. e.g. US2003140303

H03M13/1565

- a cyclic block code with minimum hamming distance d can correct up to (d-1)/2 errors
- however, as long as the code is not perfect, i.e. does not meet the Hamming bound, there exist error patterns with weight greater than (d-1)/2 that can be corrected
- algorithms that provide decoding beyond (d-1)/2 errors are to be classified using H03M13/1565

H03M13/157

- evaluation of polynomial equations, e.g. syndrome evaluation using a blockwise parallelized Horner scheme

H03M13/1575

- direct decoding denotes decoding methods/decoders that do not require the calculation and evaluation of the error locator polynomial by means of complex algorithms like Berlekamp-Massey decoding or Chien search
- direct decoding is limited to small error weights or codes with small minimum Hamming distance
- by means of direct decoding the error locator polynomial or its roots or even the error values can be directly determined from the syndromes

H03M13/158

Methods and arrangements for finite field processing when applied in an encoder or decoder for error correcting codes, e.g. a finite field multiplier.

If the finite field processing is not disclosed in the context of error control coding, then this class is not to be given.

Methods and arrangements for finite field arithmetic are always to be circulated to G06F7/72.

H03M13/25
Coded modulation.
The subgroups H03M13/251 - H03M13/258 provide details as to the type of code that is used.
The type of code can be further refined by using the appropriate Indexing Code or ECLA subgroup; e.g. coded modulation with a Reed-Muller code would be classified using H03M13/251 (coded modulation with block coding) and H03M13/136 (Reed-Muller codes).

H03M13/27
For a complete classification of a document concerning interleaving, it may be required to allocate more than one subgroup of H03M13/27 to the document.

H03M13/2703 - H03M13/2757 relate to different types of interleavers, whereas H03M13/2771 - H03M13/2796 relate to characteristics other than the type of interleaving.

Hence, a document relating to interleaving should usually have a designation of the type of interleaving (H03M13/2703 - H03M13/2757) and optionally one or more classes relating to the other characteristics (H03M13/2771 - H03M13/2796).

H03M13/2771 indicates that the document deals with interleavers/interleaving for turbo codes (so-called turbo code internal interleavers).

H03M13/2728
This subgroup covers the principle underlying a helical type interleaver for 1-bit dummy codes

H03M13/276
This subgroup covers the actual calculation of interleaving addresses.

Note that the principle underlying a particular interleaving type may be described without actually providing details about how the address or index calculation is performed or implemented.

If a document does not only relate to a particular type of interleaver but provides in addition details about the calculation of interleaver addresses or indices, then this class should be given in addition.

H03M13/2764
Circuits/hardware implementations for the calculation of interleaver addresses or indices.
See also the comments w.r.t. H03M13/276.

H03M13/2912
Product codes in which the sub-block comprising the checks-on-checks or parity-on-parity is not present (as it is either not generated or removed).

H03M13/2927
Turbo decoding of concatenated block codes is to be classified in

H03M13/2963 .
If the decoding strategy involves iterative decoding different from turbo decoding, e.g. sub-sequent decoding of rows and columns of a product code, then this feature (iterative decoding) is to be classified using H03M13/2948.
H03M13/2939
Coding schemes including any concatenation of two or more convolutional codes, wherein decoding is not based on the turbo principle, e.g. serial concatenation of convolutional codes without turbo decoding.

H03M13/2948
If the decoding strategy involves iterative decoding different from turbo decoding, e.g. decoding without exchange of extrinsic soft-decision information between decoders, then this feature (iterative decoding) is to be classified using H03M13/2948.

H03M13/2957
Note that H03M13/2957 is also to be allocated when a component code is replaced by a non-coded constraint, e.g. turbo equalisation (cf. also the Glossary of terms and the comments on H03M13/63).

H03M13/333

Feedback from the channel decoder to a synchronisation unit is used to establish synchronisation with respect to a frame or block of bits.

H03M13/336
Phase recovery in combination with channel decoding, wherein feedback from the channel decoder to phase estimation is used to achieve or improve the recovery/estimation of the symbol phase.

H03M13/3707
Decoding methods or techniques providing more than one decoding algorithm for one code and selection of the appropriate decoding method or technique
Adaptive decoding in which decoding is adapted to some extrinsic or intrinsic parameter, e.g. setting of internal thresholds.

H03M13/3715
The extrinsic or intrinsic parameter is the number of estimated errors or information about the state of the channel (e.g. SNR).

H03M13/3723
Initialisation is meant to denote the configuration of the decoder (e.g. setting of internal variables) prior to decoding.
Initialisation of MAP decoders for turbo decoding using the result of the previous iteration; initialisation of variable nodes for LDPC code decoding; initialisation of state probabilities for a tail-biting MAP decoder.

H03M13/3776

Note that re-encoding is often performed to estimate error rates but is not integral to decoding as such.

H03M13/3994

For trellis decoding, some bits may be known (e.g. during decoding of concatenated codes, padding bits) to the decoder, which exploits this information as a priori information.

The trellis decoder is forced to take the a priori known decision, for instance, by adding to the ACS circuit a decision-overriding logic or by saturating state or branch metrics.

This technique is sometimes referred to by state pinning or decision forcing or trellis pruning.

H03M13/451

For decoding, the optimum code word (in terms of a metric) is searched in a set of possible code words

The set of possible code words is often denoted by candidate code words

H03M13/456

This subgroup includes maximum likelihood or MAP decoding, wherein a list of all code words of the code or its dual code is processed.

H03M13/458

SISO decoding of block codes with updating of hard decisions of most reliable symbols using extrinsic information from least reliable symbols.

H03M13/613

Use of properties of the code to be encoded or decoded that relate to its dual code.

This includes, for instance, decoding using the trellis of the dual code instead of that of the code itself.

H03M13/63 and its subgroups:

These subgroups are intended to cover the combination of error control coding and other techniques.

These subgroups are in particular important when the so-called turbo principle is applied to e.g. demodulation (turbo demodulation) or equalisation (turbo equalisation); then, H03M13/2957 is to be used to indicate the use of the turbo principle and H03M13/6325 and H03M13/6331, respectively, are used to indicate the non-coded constraint.

H03M13/65 and its subgroups:

- These subgroups are in general independent of the error control code/scheme and relate to implementation aspects and the intended application (in terms of standardized communication systems)
- H03M13/6569 is used for documents that are specific to implementations on processors or in software (e.g. software defined radio)
- H03M13/6575 covers implementations using circuits without memory, e.g. boolean circuits; these type of circuits are often applied to encoding and decoding when the operations can be expressed by means of boolean algebra

H03M 13/09 (new)

References

Informative references

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

Error detection or correction by redundancy in data representation	G06F 11/08

H03M 13/158 (new)

Definition statement

This place covers:

Methods and arrangements for finite field processing when applied in an encoder or decoder for error correcting codes, e.g. a finite field multiplier.

References

Informative references

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

Methods or arrangements for finite field arithmetic	G06F 7/72

Special rules of classification

If the finite field processing is not disclosed in the context of error control coding, then this group is not to be given.

H03M 13/2975 (new)

References

Informative references

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

Stopping criteria for iterative decoding	H04L 1/0051

H03M 13/3905 (new)

References

Informative references

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

MAP decoding for transmission of digital information	H04L 1/0055

4. CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

CPC	**IPC**	**Action***
H03M7/3002	H03M7/32	UPDATED
H03M7/3004	H03M7/32	UPDATED
H03M7/3006	H03M7/32	UPDATED
H03M7/3008	H03M7/32	UPDATED
H03M7/3011	H03M7/32	UPDATED
H03M7/3013	H03M7/32	UPDATED
H03M7/3015	H03M7/32	UPDATED
H03M7/3017	H03M7/32	UPDATED
H03M7/302	H03M7/32	UPDATED
H03M7/3022	H03M7/36	UPDATED
H03M7/3024	H03M7/32	UPDATED
H03M7/3026	H03M7/36	UPDATED
H03M7/3028	H03M7/32	UPDATED
H03M7/3031	H03M7/32	UPDATED
H03M7/3033	H03M7/32	UPDATED
H03M7/3035	H03M7/32	UPDATED
H03M7/3037	H03M7/32	UPDATED
H03M7/304	H03M7/32	UPDATED
H03M7/3042	H03M7/32	UPDATED
H03M7/3044	H03M7/36	UPDATED
H03M7/3046	H03M7/38	UPDATED
H03M7/3048	H03M7/32	UPDATED
H03M7/3051	H03M7/34	UPDATED

*Action column:
- For an (N) or (Q) entry, provide an IPC symbol and complete the Action column with "NEW."
- For an existing CPC main trunk entry or indexing entry where the existing IPC symbol needs to be changed, provide an updated IPC symbol and complete the Action column with "UPDATED."
- For a (D) CPC entry or indexing entry complete the Action column with "DELETE." IPC symbol does not need to be included in the IPC column.
- For an (N) 2000 series CPC entry which is positioned within the main trunk scheme (breakdown code) provide an IPC symbol and complete the action column with "NEW".
- For an (N) 2000 series CPC entry positioned at the end of the CPC scheme (orthogonal code), with no IPC equivalent, complete the IPC column with "CPCONLY" and complete the action column with "NEW".

NOTES:
- F symbols are not included in the CICL table above.
- E and M symbols are not included in the CICL table above unless a change to the existing IPC is desired.