

## SECTION H — ELECTRICITY

## H03 BASIC ELECTRONIC CIRCUITRY

**H03M CODING, DECODING OR CODE CONVERSION, IN GENERAL** (using fluidic means F15C 4/00; optical analogue/digital converters G02F 7/00; 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) [4]

**Subclass index**

## CODING AND DECODING

in general.....	1/00
to or from differential modulation.....	3/00
in connection with keyboards.....	11/00

## CONVERSION

of the form of individual digits.....	5/00
of the sequence of digits.....	7/00
parallel/series or vice versa.....	9/00

ERROR DETECTION OR ERROR CORRECTION.....13/00

SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

<b>1/00</b>	<b>Analogue/digital conversion; Digital/analogue conversion</b> (conversion of analogue values to or from differential modulation H03M 3/00) [4]	1/38	• • • sequentially only, e.g. successive approximation type (converting more than one bit per step H03M 1/14) [4]
1/02	• Reversible analogue/digital converters [4]	1/40	• • • • recirculation type [4]
1/04	• using stochastic techniques [4]	1/42	• • • • Sequential comparisons in series-connected stages with no change in value of analogue signal [4]
1/06	• Continuously compensating for, or preventing, undesired influence of physical parameters (periodically H03M 1/10) [4]	1/44	• • • • Sequential comparisons in series-connected stages with change in value of analogue signal [4]
1/08	• • of noise [4]		
1/10	• Calibration or testing [4]		
1/12	• Analogue/digital converters (H03M 1/02-H03M 1/10 take precedence) [4]	1/46	• • • • with digital/analogue converter for supplying reference values to converter [4]
1/14	• • Conversion in steps with each step involving the same or a different conversion means and delivering more than one bit [4]	1/48	• • Servo-type converters [4]
		1/50	• • with intermediate conversion to time interval (H03M 1/64 takes precedence) [4]
1/16	• • • with scale factor modification, i.e. by changing the amplification between the steps [4]	1/52	• • • Input signal integrated with linear return to datum [4]
1/18	• • Automatic control for modifying the range of signals the converter can handle, e.g. gain ranging [4]	1/54	• • • Input signal sampled and held with linear return to datum [4]
1/20	• • Increasing resolution using an n bit system to obtain n + m bits, e.g. by dithering [4]	1/56	• • • Input signal compared with linear ramp [4]
1/22	• • pattern-reading type [4]	1/58	• • • Non-linear conversion [4]
1/24	• • • using relatively movable reader and disc or strip [4, 6]	1/60	• • with intermediate conversion to frequency of pulses [4]
1/26	• • • • with weighted coding, i.e. the weight given to a digit depends on the position of the digit within the block or code word, e.g. there is a given radix and the weights are powers of this radix [4]	1/62	• • • Non-linear conversion [4]
		1/64	• • with intermediate conversion to phase of sinusoidal signals [4]
1/28	• • • • with non-weighted coding [4]	1/66	• Digital/analogue converters (H03M 1/02-H03M 1/10 take precedence) [4]
1/30	• • • • • incremental [4]	1/68	• • with conversions of different sensitivity, i.e. one conversion relating to the more significant digital bits and another conversion to the less significant bits [4]
1/32	• • • using cathode-ray tubes [4]	1/70	• • Automatic control for modifying converter range [4]
1/34	• • Analogue value compared with reference values (H03M 1/48 takes precedence) [4]	1/72	• • Sequential conversion in series-connected stages (H03M 1/68 takes precedence) [4]
1/36	• • • simultaneously only, i.e. parallel type [4]		

## H03M

- 1/74 • • Simultaneous conversion [4]
- 1/76 • • • using switching tree [4]
- 1/78 • • • using ladder network [4]
- 1/80 • • • using weighted impedances (H03M 1/76 takes precedence) [4]
- 1/82 • • with intermediate conversion to time interval [4]
- 1/84 • • • Non-linear conversion [4]
- 1/86 • • with intermediate conversion to frequency of pulses [4]
- 1/88 • • • Non-linear conversion [4]
- 3/00 Conversion of analogue values to or from differential modulation [4]**
- 3/02 • Delta modulation, i.e. one-bit differential modulation [4]
- 3/04 • Differential modulation with several bits [4]
- 5/00 Conversion of the form of the representation of individual digits [4]**
- Note(s)**
- In groups H03M 5/02-H03M 5/22, in the absence of an indication to the contrary, classification is made in the last appropriate place.
- 5/02 • Conversion to or from representation by pulses [4]
- 5/04 • • the pulses having two levels [4]
- 5/06 • • • Code representation, e.g. transition, for a given bit cell depending only on the information in that bit cell [4]
- 5/08 • • • • Code representation by pulse width [4]
- 5/10 • • • • Code representation by pulse frequency [4]
- 5/12 • • • • Biphase level code, e.g. split phase code, Manchester code; Biphase space or mark code, e.g. double frequency code [4]
- 5/14 • • • Code representation, e.g. transition, for a given bit cell depending on the information in one or more adjacent bit cells, e.g. delay modulation code, double density code [4]
- 5/16 • • the pulses having three levels [4]
- 5/18 • • • two levels being symmetrical with respect to the third level, i.e. balanced bipolar ternary code [4]
- 5/20 • • the pulses having more than three levels [4]
- 5/22 • Conversion to or from representation by sinusoidal signals [4]
- 7/00 Conversion of a code where information is represented by a given sequence or number of digits to a code where the same information is represented by a different sequence or number of digits [4]**
- Note(s)**
- In groups H03M 7/02-H03M 7/30, in the absence of an indication to the contrary, classification is made in the last appropriate place.
- 7/02 • Conversion to or from weighted codes, i.e. the weight given to a digit depending on the position of the digit within the block or code word [4]
- 7/04 • • the radix thereof being two [4]
- 7/06 • • the radix thereof being a positive integer different from two [4]
- 7/08 • • • the radix being ten, i.e. pure decimal code [4]
- 7/10 • • the radix thereof being negative [4]
- 7/12 • • having two radices, e.g. binary-coded-decimal code [4]
- 7/14 • Conversion to or from non-weighted codes [4]
- 7/16 • • Conversion to or from unit-distance codes, e.g. Gray code, reflected binary code [4]
- 7/18 • • Conversion to or from residue codes [4]
- 7/20 • • Conversion to or from n-out-of-m codes [4]
- 7/22 • • • to or from one-out-of-m codes [4]
- 7/24 • • Conversion to or from floating-point codes [4]
- 7/26 • Conversion to or from stochastic codes [4]
- 7/28 • Programmable structures, i.e. where the code converter contains apparatus which is operator-changeable to modify the conversion process [4]
- 7/30 • Compression (speech analysis-synthesis for redundancy reduction G10L 19/00; for image communication H04N); Expansion; Suppression of unnecessary data, e.g. redundancy reduction [4]
- 7/32 • • Conversion to or from delta modulation, i.e. one-bit differential modulation [4]
- 7/34 • • • adaptive [4]
- 7/36 • • Conversion to or from differential modulation with several bits, i.e. the difference between successive samples being coded by more than one bit [4]
- 7/38 • • • adaptive [4]
- 7/40 • • Conversion to or from variable length codes, e.g. Shannon-Fano code, Huffman code, Morse code [4]
- 7/42 • • • using table look-up for the coding or decoding process, e.g. using read-only memory [4]
- 7/44 • • • Suppression of irrelevant zeroes [4]
- 7/46 • • Conversion to or from run-length codes, i.e. by representing the number of consecutive digits, or groups of digits, of the same kind by a code word and a digit indicative of that kind [4]
- 7/48 • • • alternating with other codes during the code conversion process, e.g. run-length coding being performed only as long as sufficiently long runs of digits of the same kind are present [4]
- 7/50 • • Conversion to or from non-linear codes, e.g. companding [4]
- 9/00 Parallel/series conversion or vice versa** (digital stores in which the information is moved stepwise G11C 19/00) [4]
- 11/00 Coding in connection with keyboards or like devices, i.e. coding of the position of operated keys** (keyboard switch arrangements, structural association of coders and keyboards H01H 13/70, H03K 17/94) [4]
- 11/02 • Details [5]
- 11/04 • • Coding of multifunction keys [5]
- 11/06 • • • by operating the multifunction key itself in different ways [5]
- 11/08 • • • • by operating selected combinations of multifunction keys [5]
- 11/10 • • • • by methods based on duration or pressure detection of keystrokes [5]
- 11/12 • • • • by operating a key a selected number of consecutive times whereafter a separate enter key is used which marks the end of the series [5]
- 11/14 • • • by using additional keys, e.g. shift keys, which determine the function performed by the multifunction key [5]
- 11/16 • • • • wherein the shift keys are operated after the operation of the multifunction keys [5]
- 11/18 • • • • wherein the shift keys are operated before the operation of the multifunction keys [5]

- 11/20 • Dynamic coding, i.e. by key scanning (H03M 11/26 takes precedence) [5]
- 11/22 • Static coding (H03M 11/26 takes precedence) [5]
- 11/24 • • using analogue means [5]
- 11/26 • using opto-electronic means [5]
- 13/00 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) [4, 7]
- 13/01 • Coding theory basic assumptions; Coding bounds; Error probability evaluation methods; Channel models; Simulation or testing of codes [7]
- 13/03 • Error detection or forward error correction by redundancy in data representation, i.e. code words containing more digits than the source words [7]
- 13/05 • • using block codes, i.e. a predetermined number of check bits joined to a predetermined number of information bits [7]
- 13/07 • • • Arithmetic codes [7]
- 13/09 • • • Error detection only, e.g. using cyclic redundancy check (CRC) codes or single parity bit [7]
- 13/11 • • • using multiple parity bits [7]
- 13/13 • • • Linear codes [7]
- 13/15 • • • • Cyclic codes, i.e. cyclic shifts of codewords produce other codewords, e.g. codes defined by a generator polynomial, Bose-Chaudhuri-Hocquenghem (BCH) codes (H03M 13/17 takes precedence) [7]
- 13/17 • • • • Burst error correction, e.g. error trapping, Fire codes [7]
- 13/19 • • • • Single error correction without using particular properties of the cyclic codes, e.g. Hamming codes, extended or generalised Hamming codes [7]
- 13/21 • • • Non-linear codes, e.g. m-bit data word to n-bit code word (mBnB) conversion with error detection or error correction [7]
- 13/23 • • using convolutional codes, e.g. unit memory codes [7]
- 13/25 • Error detection or forward error correction by signal space coding, i.e. adding redundancy in the signal constellation, e.g. Trellis Coded Modulation (TCM) [7]
- 13/27 • using interleaving techniques [7]
- 13/29 • combining two or more codes or code structures, e.g. product codes, generalised product codes, concatenated codes, inner and outer codes [7]
- 13/31 • combining coding for error detection or correction and efficient use of the spectrum (without error detection or correction H03M 5/14) [7]
- 13/33 • Synchronisation based on error coding or decoding [7]
- 13/35 • Unequal or adaptive error protection, e.g. by providing a different level of protection according to significance of source information or by adapting the coding according to the change of transmission channel characteristics [7]
- 13/37 • Decoding methods or techniques, not specific to the particular type of coding provided for in groups H03M 13/03-H03M 13/35 [7]
- 13/39 • • Sequence estimation, i.e. using statistical methods for the reconstruction of the original codes [7]
- 13/41 • • • using the Viterbi algorithm or Viterbi processors [7]
- 13/43 • • Majority logic or threshold decoding [7]
- 13/45 • • Soft decoding, i.e. using symbol reliability information (H03M 13/41 takes precedence) [7]
- 13/47 • Error detection, forward error correction or error protection, not provided for in groups H03M 13/01-H03M 13/37 [7]
- 13/49 • • Unidirectional error detection or correction [7]
- 13/51 • • Constant weight codes; n-out-of-m codes; Berger codes [7]
- 13/53 • • Codes using Fibonacci numbers series [7]
- 99/00 Subject matter not provided for in other groups of this subclass [2006.01]**