Symbol	Typ	Titel
H	**Sektion**	**SECTION H — ELECTRICITY**
H04	**Klasse**	**ELECTRIC COMMUNICATION TECHNIQUE**
H04L	**Unterklasse**	**TRANSMISSION OF DIGITAL INFORMATION, e.g. TELEGRAPHIC COMMUNICATION (typewriters B41J; order telegraphs, fire or police telegraphs G08B; visual telegraphy G08B, G08C; teleautographic systems G08C; ciphering or deciphering apparatus per se G09C; coding, decoding or code conversion, in general H03M; arrangements common to telegraphic and telephonic communication H04M; selecting H04Q) [4]**
H04L 1/00	**Hauptgruppe**	**Arrangements for detecting or preventing errors in the information received (correcting synchronisation H04L 7/00; arrangements in the transmission path H04B)**
H04L 1/02	1-Punkt Untergruppe	. by diversity reception (in general H04B 7/02)
H04L 1/04	2-Punkt Untergruppe	. . using frequency diversity
H04L 1/06	2-Punkt Untergruppe	. . using space diversity
H04L 1/08	1-Punkt Untergruppe	. by repeating transmission, e.g. Verdan system
H04L 1/12	1-Punkt Untergruppe	. by using return channel
H04L 1/14	2-Punkt Untergruppe	. . in which the signals are sent back to the transmitter to be checked
H04L 1/16	2-Punkt Untergruppe	. . in which the return channel carries supervisory signals, e.g. repetition request signals
H04L 1/18	3-Punkt Untergruppe	. . . Automatic repetition systems, e.g. van Duuren system
H04L 1/20	1-Punkt Untergruppe	. using signal-quality detector [3]
H04L 1/22	1-Punkt Untergruppe	. using redundant apparatus to increase reliability [3]
H04L 1/24	1-Punkt Untergruppe	. Testing correct operation [3]
H04L 5/00	**Hauptgruppe**	**Arrangements affording multiple use of the transmission path (multiplex communication in general H04J)**
H04L 5/02	1-Punkt Untergruppe	. Channels characterised by the type of signal
H04L 5/04	2-Punkt Untergruppe	. . the signals being represented by different amplitudes or polarities, e.g. quadriplex
H04L 5/06	2-Punkt Untergruppe	. . the signals being represented by different frequencies (combined with time-division multiplexing H04L 5/26)
H04L 5/08	3-Punkt Untergruppe	. . . each combination of signals in different channels being represented by a fixed frequency
H04L 5/10	3-Punkt Untergruppe	. . . with dynamo-electric generation of carriers; with mechanical filters or demodulators
H04L 5/12	2-Punkt Untergruppe	. . the signals being represented by different phase modulations of a single carrier
H04L 5/14	1-Punkt Untergruppe	. Two-way operation using the same type of signal, i.e. duplex (conditioning for two-way transmission in general H04B 3/20)
H04L 5/16	2-Punkt Untergruppe	. . Half-duplex systems; Simplex/duplex switching; Transmission of break signals
H04L 5/18	2-Punkt Untergruppe	. . Automatic changing of the traffic direction
H04L 5/20	1-Punkt Untergruppe	. using different combinations of lines, e.g. phantom working
H04L 5/22	1-Punkt Untergruppe	. using time-division multiplexing
H04L 5/24	2-Punkt Untergruppe	. . with start-stop synchronous converters

Symbol	Typ	Titel
H04L 5/26	2-Punkt Untergruppe	. . combined with the use of different frequencies
H04L 7/00	**Hauptgruppe**	**Arrangements for synchronising receiver with transmitter**
H04L 7/02	1-Punkt Untergruppe	. Speed or phase control by the received code signals, the signals containing no special synchronisation information
H04L 7/027	2-Punkt Untergruppe	. . extracting the synchronising or clock signal from the received signal spectrum, e.g. by using a resonant or bandpass circuit [5]
H04L 7/033	2-Punkt Untergruppe	. . using the transitions of the received signal to control the phase of the synchronising-signal- generating means, e.g. using a phase-locked loop [5]
H04L 7/04	1-Punkt Untergruppe	. Speed or phase control by synchronisation signals
H04L 7/06	2-Punkt Untergruppe	. . the synchronisation signals differing from the information signals in amplitude, polarity, or frequency
H04L 7/08	2-Punkt Untergruppe	. . the synchronisation signals recurring cyclically
H04L 7/10	2-Punkt Untergruppe	. . Arrangements for initial synchronisation
H04L 9/00	**Hauptgruppe**	**Arrangements for secret or secure communication (spread spectrum techniques in general H04B 1/69)**
H04L 9/06	1-Punkt Untergruppe	. the encryption apparatus using shift registers or memories for blockwise coding, e.g. D.E.S. systems [5]
H04L 9/08	2-Punkt Untergruppe	. . Key distribution [5]
H04L 9/10	1-Punkt Untergruppe	. with particular housing, physical features or manual controls [5]
H04L 9/12	1-Punkt Untergruppe	. Transmitting and receiving encryption devices synchronised or initially set up in a particular manner [5]
H04L 9/14	1-Punkt Untergruppe	. using a plurality of keys or algorithms [5]
H04L 9/16	2-Punkt Untergruppe	. . the keys or algorithms being changed during operation [5]
H04L 9/18	1-Punkt Untergruppe	. Encryption by serially and continuously modifying data stream elements, e.g. stream cipher systems [5]
H04L 9/20	2-Punkt Untergruppe	. . Pseudorandom key sequence combined element-for-element with data sequence [5]
H04L 9/22	3-Punkt Untergruppe	. . . with particular pseudorandom sequence generator [5]
H04L 9/24	4-Punkt Untergruppe	. . . . sequence produced by more than one generator [5]
H04L 9/26	4-Punkt Untergruppe	. . . . producing a nonlinear pseudorandom sequence [5]
H04L 9/28	1-Punkt Untergruppe	. using particular encryption algorithm [5]
H04L 9/30	2-Punkt Untergruppe	. . Public key, i.e. encryption algorithm being computationally infeasible to invert and users' encryption keys not requiring secrecy [5]
H04L 9/32	1-Punkt Untergruppe	. including means for verifying the identity or authority of a user of the system (computer systems G06F; coin-freed or like apparatus with coded identity card or credit card G07F 7/08) [5]
H04L 9/34	1-Punkt Untergruppe	. Bits, or blocks of bits, of the telegraphic message being interchanged in time [5]
H04L 9/36	1-Punkt Untergruppe	. with means for detecting characters not meant for transmission [5]
H04L 9/38	1-Punkt Untergruppe	. Encryption being effected by mechanical apparatus, e.g. rotating cams, switches, keytape punchers [5]
H04L 12/00	**Hauptgruppe**	**Data switching networks (interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units G06F 13/00) [5]**
H04L 12/02	1-Punkt Untergruppe	. Details [5]
H04L 12/04	2-Punkt Untergruppe	. . Switchboards [5]

Symbol	Typ	Titel
H04L 12/06	2-Punkt Untergruppe	. . Answer-back mechanisms or circuits [5]
H04L 12/08	2-Punkt Untergruppe	. . Allotting numbers to messages; Counting characters, words or messages [5]
H04L 12/10	2-Punkt Untergruppe	. . Current supply arrangements [5]
H04L 12/12	2-Punkt Untergruppe	. . Arrangements for remote connection or disconnection of substations or of equipment thereof [5]
H04L 12/14	2-Punkt Untergruppe	. . Charging arrangements [5]
H04L 12/16	2-Punkt Untergruppe	. . Arrangements for providing special services to substations [5]
H04L 12/18	3-Punkt Untergruppe	. . . for broadcast or conference [5]
H04L 12/20	3-Punkt Untergruppe	. . . for converting transmission speed from the inherent speed of a substation to the inherent speed of other substations [5]
H04L 12/22	2-Punkt Untergruppe	. . Arrangements for preventing the taking of data from a data transmission channel without authorisation (means for verifying the identity or the authority of a user of a secure or secret communication system H04L 9/32) [5]
H04L 12/24	2-Punkt Untergruppe	. . Arrangements for maintenance or administration [5]
H04L 12/26	2-Punkt Untergruppe	. . Monitoring arrangements; Testing arrangements [5]
H04L 12/28	1-Punkt Untergruppe	. characterised by path configuration, e.g. local area networks (LAN), wide area networks (WAN) [5, 6]
H04L 12/40	2-Punkt Untergruppe	. . Bus networks [5, 6]
H04L 12/403	3-Punkt Untergruppe	. . . with centralised control, e.g. polling [6]
H04L 12/407	3-Punkt Untergruppe	. . . with decentralised control [6]
H04L 12/413	4-Punkt Untergruppe	. . . . with random access, e.g. carrier-sense multiple-access with collision detection (CSMA-CD) [6]
H04L 12/417	4-Punkt Untergruppe	. . . . with deterministic access, e.g. token passing [6]
H04L 12/42	2-Punkt Untergruppe	. . Loop networks [5, 6]
H04L 12/423	3-Punkt Untergruppe	. . . with centralised control, e.g. polling [6]
H04L 12/427	3-Punkt Untergruppe	. . . with decentralised control [6]
H04L 12/43	4-Punkt Untergruppe	. . . . with synchronous transmission, e.g. time division multiplex (TDM), slotted rings [6]
H04L 12/433	4-Punkt Untergruppe	. . . . with asynchronous transmission, e.g. token ring, register insertion [6]
H04L 12/437	3-Punkt Untergruppe	. . . Ring fault isolation or reconfiguration [6]
H04L 12/44	2-Punkt Untergruppe	. . Star or tree networks [5, 6]
H04L 12/46	2-Punkt Untergruppe	. . Interconnection of networks [5, 6]
H04L 12/50	1-Punkt Untergruppe	. Circuit switching systems, i.e. systems in which the path is physically permanent during the communication [5, 6]
H04L 12/52	2-Punkt Untergruppe	. . using time division techniques (in digital transmission systems H04L 5/22) [5, 6]
H04L 12/54	1-Punkt Untergruppe	. Stored and forward switching systems [5, 6]
H04L 12/56	2-Punkt Untergruppe	. . Packet switching systems [5, 6]
H04L 12/58	2-Punkt Untergruppe	. . Message switching systems (permutation- code selecting H04Q 3/02) [5, 6]

Symbol	Typ	Titel
H04L 12/60	3-Punkt Untergruppe	. . . Manual relay systems, e.g. push-button switching [5, 6]
H04L 12/62	4-Punkt Untergruppe	. . . . with perforated tape storage [5, 6]
H04L 12/64	1-Punkt Untergruppe	. Hybrid switching systems [5, 6]
H04L 12/66	1-Punkt Untergruppe	. Arrangements for connecting between networks having differing types of switching systems, e.g. gateways [5, 6]
H04L 13/00	**Hauptgruppe**	**Details of the apparatus or circuits covered by groups H04L 15/00 or H04L 17/00**
H04L 13/02	1-Punkt Untergruppe	. Details not particular to receiver or transmitter
H04L 13/04	2-Punkt Untergruppe	. . Driving mechanisms; Clutches (in general F16)
H04L 13/06	2-Punkt Untergruppe	. . Tape or page guiding or feeding devices
H04L 13/08	2-Punkt Untergruppe	. . Intermediate storage means
H04L 13/10	2-Punkt Untergruppe	. . Distributors
H04L 13/12	3-Punkt Untergruppe	. . . Non-mechanical distributors, e.g. relay distributors
H04L 13/14	4-Punkt Untergruppe	. . . . Electronic distributors (in general H03K 17/00)
H04L 13/16	1-Punkt Untergruppe	. of transmitters, e.g. code-bars, code-discs
H04L 13/18	1-Punkt Untergruppe	. of receivers
H04L 15/00	**Hauptgruppe**	**Apparatus or local circuits for transmitting or receiving dot-and-dash codes, e.g. Morse code (teaching apparatus therefor G09B; keyboard switches in general H01H 13/70, H03K 17/94; telegraph tapping keys H01H 21/86; coding in connection with keyboards or like devices, in general H03M 11/00)**
H04L 15/03	1-Punkt Untergruppe	. Keys structurally combined with sound generators [2]
H04L 15/04	1-Punkt Untergruppe	. Apparatus or circuits at the transmitting end
H04L 15/06	2-Punkt Untergruppe	. . with a restricted number of keys, e.g. separate key for each type of code element
H04L 15/08	3-Punkt Untergruppe	. . . with a single key which transmits dots in one position and dashes in a second position
H04L 15/10	3-Punkt Untergruppe	. . . combined with perforating apparatus
H04L 15/12	2-Punkt Untergruppe	. . with keyboard co-operating with code-bars
H04L 15/14	3-Punkt Untergruppe	. . . combined with perforating apparatus
H04L 15/16	2-Punkt Untergruppe	. . with keyboard co-operating with code discs
H04L 15/18	2-Punkt Untergruppe	. . Automatic transmitters, e.g. controlled by perforated tape
H04L 15/20	3-Punkt Untergruppe	. . . with optical sensing means
H04L 15/22	2-Punkt Untergruppe	. . Apparatus or circuits for sending one or a restricted number of signals, e.g. distress signals
H04L 15/24	1-Punkt Untergruppe	. Apparatus or circuits at the receiving end
H04L 15/26	2-Punkt Untergruppe	. . operating only on reception of predetermined code signals, e.g. distress signals, party-line call signals
H04L 15/28	2-Punkt Untergruppe	. . Code reproducing apparatus
H04L 15/30	3-Punkt Untergruppe	. . . Writing recorders
H04L 15/32	3-Punkt Untergruppe	. . . Perforating recorders

Symbol	Typ	Titel
H04L 15/34	2-Punkt Untergruppe	. . Apparatus for recording received coded signals after translation, e.g. as type-characters
H04L 17/00	**Hauptgruppe**	**Apparatus or local circuits for transmitting or receiving codes wherein each character is represented by the same number of equal-length code elements, e.g. Baudot code (keyboard switches in general H01H 13/70, H03K 17/94; coding in connection with keyboards or like devices, in general H03M 11/00)**
H04L 17/02	1-Punkt Untergruppe	. Apparatus or circuits at the transmitting end
H04L 17/04	2-Punkt Untergruppe	. . with keyboard co-operating with code-bars
H04L 17/06	3-Punkt Untergruppe	. . . Contact operating means
H04L 17/08	3-Punkt Untergruppe	. . . combined with perforating apparatus
H04L 17/10	2-Punkt Untergruppe	. . with keyboard co-operating with code-discs
H04L 17/12	2-Punkt Untergruppe	. . Automatic transmitters, e.g. controlled by perforated tape
H04L 17/14	3-Punkt Untergruppe	. . . with optical sensing means
H04L 17/16	1-Punkt Untergruppe	. Apparatus or circuits at the receiving end
H04L 17/18	2-Punkt Untergruppe	. . Code selection mechanisms
H04L 17/20	2-Punkt Untergruppe	. . using perforating recorders
H04L 17/22	2-Punkt Untergruppe	. . using mechanical translation and type-bar printing
H04L 17/24	2-Punkt Untergruppe	. . using mechanical translation and type-head printing, e.g. type-wheel, type-cylinder
H04L 17/26	2-Punkt Untergruppe	. . using aggregate motion translation
H04L 17/28	2-Punkt Untergruppe	. . using pneumatic or hydraulic translation
H04L 17/30	2-Punkt Untergruppe	. . using electric or electronic translation
H04L 19/00	**Hauptgruppe**	**Apparatus or local circuits for step-by-step systems**
H04L 21/00	**Hauptgruppe**	**Apparatus or local circuits for mosaic printer telegraph systems**
H04L 21/02	1-Punkt Untergruppe	. at the transmitting end
H04L 21/04	1-Punkt Untergruppe	. at the receiving end
H04L 23/00	**Hauptgruppe**	**Apparatus or local circuits for systems other than those covered by groups H04L 15/00-H04L 21/00**
H04L 23/02	1-Punkt Untergruppe	. adapted for orthogonal signalling [2]
H04L 25/00	**Hauptgruppe**	**Baseband systems**
H04L 25/02	1-Punkt Untergruppe	. Details (circuits in general for handling pulses H03K; in line transmission systems in general H04B 3/02)
H04L 25/03	2-Punkt Untergruppe	. . Shaping networks in transmitter or receiver, e.g. adaptive shaping networks (impedance networks per se H03H) [2]
H04L 25/04	3-Punkt Untergruppe	. . . Passive shaping networks [2]
H04L 25/05	2-Punkt Untergruppe	. . Electric or magnetic storage of signals before transmitting or retransmitting for changing the transmission rate [7]
H04L 25/06	2-Punkt Untergruppe	. . Dc level restoring means; Bias distortion correction
H04L 25/08	2-Punkt Untergruppe	. . Modifications for reducing interference; Modifications for reducing effects due to line faults

Symbol	Typ	Titel
H04L 25/10	2-Punkt Untergruppe	. . Compensating for variations in line balance
H04L 25/12	2-Punkt Untergruppe	. . Compensating for variations in line impedance
H04L 25/14	2-Punkt Untergruppe	. . Channel dividing arrangements
H04L 25/17	2-Punkt Untergruppe	. . Interpolating arrangements [4]
H04L 25/18	2-Punkt Untergruppe	. . Arrangements for inductively generating telegraphic signals (induction coil interrupters H01H 51/34; dynamo-electric generators H02K)
H04L 25/20	2-Punkt Untergruppe	. . Repeater circuits; Relay circuits
H04L 25/22	3-Punkt Untergruppe	. . . Repeaters for converting two wires to four wires (in general H04B); Repeaters for converting single current to double current
H04L 25/24	3-Punkt Untergruppe	. . . Relay circuits using discharge tubes or semiconductor devices
H04L 25/26	3-Punkt Untergruppe	. . . Circuits with optical sensing means
H04L 25/28	3-Punkt Untergruppe	. . . Repeaters using modulation and subsequent demodulation
H04L 25/30	1-Punkt Untergruppe	. Non-synchronous systems
H04L 25/32	2-Punkt Untergruppe	. . characterised by the code employed
H04L 25/34	3-Punkt Untergruppe	. . . using three or more different amplitudes, e.g. cable code
H04L 25/38	1-Punkt Untergruppe	. Synchronous or start-stop systems, e.g. for Baudot code
H04L 25/40	2-Punkt Untergruppe	. . Transmitting circuits; Receiving circuits (repeater circuits, relay circuits H04L 25/52)
H04L 25/42	3-Punkt Untergruppe	. . . using mechanical distributors
H04L 25/44	3-Punkt Untergruppe	. . . using relay distributors
H04L 25/45	3-Punkt Untergruppe	. . . using electronic distributors (electronic distributors in general H03K 17/00) [2]
H04L 25/46	3-Punkt Untergruppe	. . . using tuning forks or vibrating reeds
H04L 25/48	3-Punkt Untergruppe	. . . characterised by the code employed (H04L 25/49 takes precedence) [2]
H04L 25/49	3-Punkt Untergruppe	. . . using code conversion at the transmitter; using predistortion; using insertion of idle bits for obtaining a desired frequency spectrum; using three or more amplitude levels [2]
H04L 25/493	4-Punkt Untergruppe	. . . . by transition coding, i.e. the time-position or direction of a transition being encoded before transmission [3]
H04L 25/497	4-Punkt Untergruppe	. . . . by correlative coding, e.g. partial response coding or echo modulation coding [3]
H04L 25/52	2-Punkt Untergruppe	. . Repeater circuits; Relay circuits
H04L 25/54	3-Punkt Untergruppe	. . . using mechanical distributors
H04L 25/56	3-Punkt Untergruppe	. . . Non-electrical regenerative repeaters
H04L 25/58	3-Punkt Untergruppe	. . . using relay distributors
H04L 25/60	3-Punkt Untergruppe	. . . Regenerative repeaters with electromagnetic switches
H04L 25/62	3-Punkt Untergruppe	. . . using tuning forks or vibrating reeds
H04L 25/64	3-Punkt Untergruppe	. . . Start-stop regenerative repeaters using discharge tubes or semiconductor devices

Symbol	Typ	Titel
H04L 25/66	3-Punkt Untergruppe	. . . Synchronous repeaters using discharge tubes or semiconductor devices
H04L 27/00	**Hauptgruppe**	**Modulated-carrier systems**
H04L 27/01	1-Punkt Untergruppe	. Equalisers [5]
H04L 27/02	1-Punkt Untergruppe	. Amplitude-modulated carrier systems, e.g. using on/off keying; Single sideband or vestigial sideband modulation (H04L 27/32 takes precedence) [2, 5]
H04L 27/04	2-Punkt Untergruppe	. . Modulator circuits (in general H03C); Transmitter circuits
H04L 27/06	2-Punkt Untergruppe	. . Demodulator circuits (in general H03D); Receiver circuits
H04L 27/08	2-Punkt Untergruppe	. . Amplitude regulation arrangements
H04L 27/10	1-Punkt Untergruppe	. Frequency-modulated carrier systems, i.e. using frequency-shift keying (H04L 27/32 takes precedence) [5]
H04L 27/12	2-Punkt Untergruppe	. . Modulator circuits (in general H03C); Transmitter circuits
H04L 27/14	2-Punkt Untergruppe	. . Demodulator circuits (in general H03D); Receiver circuits
H04L 27/144	3-Punkt Untergruppe	. . . with demodulation using spectral properties of the received signal, e.g. by using frequency selective- or frequency sensitive elements [6]
H04L 27/148	4-Punkt Untergruppe	. . . . using filters, including PLL-type filters [6]
H04L 27/152	4-Punkt Untergruppe	. . . . using controlled oscillators, e.g. PLL arrangements [6]
H04L 27/156	3-Punkt Untergruppe	. . . with demodulation using temporal properties of the received signal, e.g. detecting pulse width [6]
H04L 27/16	2-Punkt Untergruppe	. . Frequency regulation arrangements
H04L 27/18	1-Punkt Untergruppe	. Phase-modulated carrier systems, i.e. using phase-shift keying (H04L 27/32 takes precedence) [5]
H04L 27/20	2-Punkt Untergruppe	. . Modulator circuits (in general H03C); Transmitter circuits
H04L 27/22	2-Punkt Untergruppe	. . Demodulator circuits (in general H03D); Receiver circuits
H04L 27/227	3-Punkt Untergruppe	. . . using coherent demodulation [6]
H04L 27/233	3-Punkt Untergruppe	. . . using non-coherent demodulation [6]
H04L 27/24	2-Punkt Untergruppe	. . Half-wave signalling systems
H04L 27/26	1-Punkt Untergruppe	. Systems using multi-frequency codes (H04L 27/32 takes precedence) [5]
H04L 27/28	2-Punkt Untergruppe	. . with simultaneous transmission of different frequencies each representing one code element
H04L 27/30	2-Punkt Untergruppe	. . wherein each code element is represented by a combination of frequencies
H04L 27/32	1-Punkt Untergruppe	. Carrier systems characterised by combinations of two or more of the types covered by groups H04L 27/02, H04L 27/10, H04L 27/18, or H04L 27/26 [5]
H04L 27/34	2-Punkt Untergruppe	. . Amplitude- and phase-modulated carrier systems, e.g. quadrature-amplitude modulated carrier systems [5]
H04L 27/36	3-Punkt Untergruppe	. . . Modulator circuits; Transmitter circuits [5]
H04L 27/38	3-Punkt Untergruppe	. . . Demodulator circuits; Receiver circuits [5]
H04L 29/00	**Hauptgruppe**	**Arrangements, apparatus, circuits or systems, not covered by a single one of groups H04L 1/00-H04L 27/00 (interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units G06F 13/00) [5]**
H04L 29/02	1-Punkt Untergruppe	. Communication control; Communication processing (H04L 29/12, H04L 29/14 take precedence) [5]

Symbol	Typ	Titel
H04L 29/04	2-Punkt Untergruppe	. . for plural communication lines [5]
H04L 29/06	2-Punkt Untergruppe	. . characterised by a protocol [5]
H04L 29/08	3-Punkt Untergruppe	. . . Transmission control procedure, e.g. data link level control procedure [5]
H04L 29/10	2-Punkt Untergruppe	. . characterised by an interface, e.g. the interface between the data link level and the physical level [5]
H04L 29/12	1-Punkt Untergruppe	. characterised by the data terminal [5]
H04L 29/14	1-Punkt Untergruppe	. Counter-measures to a fault [5]