

CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H04 ELECTRIC COMMUNICATION TECHNIQUE

(NOTE omitted)

H04B TRANSMISSION

NOTE

This subclass covers the transmission of information-carrying signals, the transmission being independent of the nature of the information, and includes monitoring and testing arrangements and the suppression and limitation of noise and interference.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

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| <p>1/00</p> | <p>Details of transmission systems, not covered by a single one of groups H04B 3/00 - H04B 13/00; Details of transmission systems not characterised by the medium used for transmission</p> | <p>1/0035</p> | <p>. . . {Channel filtering, i.e. selecting a frequency channel within a software radio system (multiplexing of multicarrier modulation signals being represented by different frequencies H04L 5/06; multiplexing of multicarrier modulation signals H04L 5/023)}</p> |
| | <p>NOTE</p> <p>In this group, group H04B 1/0003 takes precedence over groups H04B 1/005 - H04B 1/76</p> | 1/0039 | . . . {using DSP [Digital Signal Processor] quadrature modulation and demodulation} |
| 1/0003 | . {Software-defined radio [SDR] systems, i.e. systems wherein components typically implemented in hardware, e.g. filters or modulators/demodulators, are implented using software, e.g. by involving an AD or DA conversion stage such that at least part of the signal processing is performed in the digital domain (digital baseband systems H04L 25/00 ; digital modulation/demodulation H04L 27/00 ; CDMA H04B 1/707 ; TDMA H04B 7/2643 ; image transmission H04N 5/00)} | 1/0042 | . . . {Digital filtering (H04B 1/0035 takes precedence; digital filters per se H03H 17/00)} |
| | | 1/0046 | . . . {Decimation, i.e. data rate reduction techniques} |
| 1/0007 | . . {wherein the AD/DA conversion occurs at radiofrequency or intermediate frequency stage} | 1/005 | . {adapting radio receivers, transmitters and transceivers for operation on two or more bands, i.e. frequency ranges} |
| 1/001 | . . . {Channel filtering, i.e. selecting a frequency channel within the SDR system (multiplexing of multicarrier modulation signals being represented by different frequencies H04L 5/06 ; multiplexing of multicarrier modulation signals H04L 5/023)} | 1/0053 | . . {with common antenna for more than one band} |
| | | 1/0057 | . . . {using diplexing or multiplexing filters for selecting the desired band} |
| 1/0014 | . . . {using DSP [Digital Signal Processor] quadrature modulation and demodulation} | 1/006 | . . . {using switches for selecting the desired band (H04B 1/0057 takes precedence)} |
| 1/0017 | . . . {Digital filtering (H04B 1/001 takes precedence; digital filters per se H03H 17/00)} | 1/0064 | . . {with separate antennas for the more than one band (H04B 1/0053 takes precedence)} |
| 1/0021 | . . . {Decimation, i.e. data rate reduction techniques (H04B 1/0025 takes precedence)} | 1/0067 | . . {with one or more circuit blocks in common for different bands} |
| 1/0025 | . . . {using a sampling rate lower than twice the highest frequency component of the sampled signal (for demodulation of angle-modulated signals H03D 3/006)} | 1/0071 | . . . {using a common intermediate frequency for more than one band (H04B 1/0075 takes precedence)} |
| 1/0028 | . . {wherein the AD/DA conversion occurs at baseband stage} | 1/0075 | . . . {using different intermediate frequencied for the different bands} |
| 1/0032 | . . . {with analogue quadrature frequency conversion to and from the baseband (quadrature modulators and demodulators per se H03D 3/007 , H03C 3/40)} | 1/0078 | {with a common intermediate frequency amplifier for the different intermediate frequencies, e.g. when using switched intermediate frequency filters} |
| | | 1/0082 | . . . {with a common local oscillator for more than one band} |
| | | 1/0085 | {where one band is the image frequency band of the other and the band selection is done by image rejection} |
| | | 1/0089 | {using a first intermediate frequency higher than the highest of any band received} |
| | | 1/0092 | {using a wideband front end} |
| | | 1/0096 | . . {where a full band is frequency converted into another full band} |

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| 1/02 | . Transmitters | 1/123 | {using adaptive balancing or compensation means (adaptive filter circuits and algorithms H03H)} |
| 1/03 | . . Constructional details, e.g. casings, housings | 1/126 | {having multiple inputs, e.g. auxiliary antenna for receiving interfering signal (aerials in general H01Q)} |
| 1/034 | . . . Portable transmitters | 1/14 | . . . Automatic detuning arrangements |
| 1/0343 | {to be carried on the body} | 1/16 | . . Circuits |
| 1/0346 | {Hand-held transmitters} | 1/1607 | . . . {Supply circuits (converters H02M ; filters therefor H02M 1/14 ; voltage stabilisers G05F 1/46)} |
| 1/036 | . . . Cooling arrangements | 1/1615 | {Switching on; Switching off, e.g. remotely (battery saving circuits associated with selective call operation H04W 52/00 ; details of power consumption reduction in a PLL, H03L 7/0802 , H03L 7/14 , H03L 2207/08 , H03L 2207/18 ; muting amplifiers by gain control see H03G 3/34)} |
| 1/04 | . . Circuits | 1/1623 | {using tubes} |
| 2001/0408 | . . . {with power amplifiers} | 1/163 | . . . {Special arrangements for the reduction of the damping of resonant circuits of receivers (amplifiers H03F ; negative impedance networks for line transmission systems H04B 3/16)} |
| 2001/0416 | {having gain or transmission power control} | 1/1638 | . . . {Special circuits to enhance selectivity of receivers not otherwise provided for (resonant circuits H03H)} |
| 2001/0425 | {with linearisation using predistortion} | 1/1646 | . . . {adapted for the reception of stereophonic signals} |
| 2001/0433 | {with linearisation using feedback} | 1/1653 | {Detection of the presence of stereo signals and pilot signal regeneration} |
| 2001/0441 | {with linearisation using feed-forward} | 1/1661 | {Reduction of noise by manipulation of the baseband composite stereophonic signal or the decoded left and right channels} |
| 2001/045 | {with means for improving efficiency} | 1/1669 | {of the demodulated composite stereo signal} |
| 1/0458 | . . . {Arrangements for matching and coupling between power amplifier and antenna or between amplifying stages (matching circuits in general H03H)} | 1/1676 | {of the sum or difference signal} |
| 1/0466 | . . . {Fault detection or indication (H04B 1/0483 takes precedence)} | 1/1684 | {of the decoded left or right stereo channel} |
| 1/0475 | . . . {with means for limiting noise, interference or distortion (H04B 1/0483 takes precedence)} | 1/1692 | {using companding of the stereo difference signal, e.g. FMX (volume compression or expansion in amplifiers H03G 7/00)} |
| 1/0483 | . . . {Transmitters with multiple parallel paths} | 1/18 | . . . Input circuits, e.g. for coupling to an antenna or a transmission line (coupling networks between antennas or lines and receivers independent of the nature of the receiver H03H) |
| 2001/0491 | . . . {with frequency synthesizers, frequency converters or modulators} | 1/20 | . . . for coupling gramophone pick-up, recorder output, or microphone to receiver |
| 1/06 | . Receivers | 1/202 | {by remote control} |
| 1/08 | . . Constructional details, e.g. cabinet | 1/205 | {with control bus for exchanging commands between units} |
| 1/082 | . . . {to be used in vehicles (H04B 1/086 takes precedence; holding or mounting accessories B60R 11/02)} | 1/207 | {with an audio or audio/video bus for signal distribution (H04B 1/205 takes precedence)} |
| 2001/084 | {with removable front panel} | 1/22 | . . . for receivers in which no local oscillation is generated |
| 1/086 | . . . {Portable receivers} | 1/24 | the receiver comprising at least one semiconductor device having three or more electrodes |
| 1/088 | {with parts of the receiver detachable or collapsible} | 1/26 | . . . for superheterodyne receivers (multiple frequency-changing H03D 7/16) |
| 1/10 | . . Means associated with receiver for limiting or suppressing noise or interference | 1/28 | the receiver comprising at least one semiconductor device having three or more electrodes |
| 1/1009 | . . . {Placing the antenna at a place where the noise level is low and using a noise-free transmission line between the antenna and the receivers (screened aerials H01Q 7/04 ; feeders for aerials H01Q 9/00)} | 1/30 | . . . for homodyne or synchrodyne receivers (demodulator circuits H03D 1/22) |
| 1/1018 | . . . {noise filters connected between the power supply and the receiver (suppression or limitation of noise from electric apparatus H04B 15/00 ; demodulation H03D ; ripple filters H02M 1/14 ; filters in general 95G , H03H ; power supplies H04B 1/1607)} | | |
| 1/1027 | . . . {assessing signal quality or detecting noise/interference for the received signal} | | |
| 1/1036 | {with automatic suppression of narrow band noise or interference, e.g. by using tuneable notch filters (H04B 1/123 takes precedence; filter circuits H03H)} | | |
| 2001/1045 | {Adjacent-channel interference} | | |
| 2001/1054 | {by changing bandwidth} | | |
| 2001/1063 | {using a notch filter} | | |
| 2001/1072 | {by tuning the receiver frequency} | | |
| 1/1081 | . . . {Reduction of multipath noise (by equalising H04B 7/005)} | | |
| 1/109 | . . . {by improving strong signal performance of the receiver when strong unwanted signals are present at the receiver input} | | |
| 1/12 | . . . Neutralising, balancing, or compensation arrangements | | |

- 1/302 {for single sideband receivers ([demodulator circuits H03D 1/24](#))}
- 2001/305 {using dc offset compensation techniques}
- 2001/307 {using n-port mixer}
- 1/38 . Transceivers, i.e. devices in which transmitter and receiver form a structural unit and in which at least one part is used for functions of transmitting and receiving
- 1/3805 . . with built-in auxiliary receivers
- 2001/3811 . . . {Split configuration of transmission devices}
- 1/3816 . . Mechanical arrangements for accommodating identification devices, e.g. cards or chips; with connectors for programming identification devices
- 1/3818 . . . Arrangements for facilitating insertion or removal of identification devices
- 1/3822 . . specially adapted for use in vehicles ([H04B 1/3827 takes precedence](#))
- 1/3827 . . Portable transceivers
- 1/3833 . . . {Hand-held transceivers}
- 1/3838 {Arrangements for reducing RF exposure to the user, e.g. by changing the shape of the transceiver while in use}
- 2001/3844 {with means to alert the user that a certain exposure has been reached}
- 1/385 . . . {Transceivers carried on the body, e.g. in helmets}
- 2001/3855 {carried in a belt or harness}
- 2001/3861 {carried in a hand or on fingers}
- 2001/3866 {carried on the head}
- 2001/3872 {with extendable microphones or earphones}
- 1/3877 . . . Arrangements for enabling portable transceivers to be used in a fixed position, e.g. cradles or boosters
- 1/3883 . . . Arrangements for mounting batteries or battery chargers
- 1/3888 . . . Arrangements for carrying or protecting transceivers
- 2001/3894 . . {Waterproofing of transmission device}
- 1/40 . . Circuits
- 1/401 . . . for selecting or indicating operating mode
- 1/403 . . . using the same oscillator for generating both the transmitter frequency and the receiver local oscillator frequency
- 1/405 with multiple discrete channels
- 1/406 {with more than one transmission mode, e.g. analog and digital modes}
- 1/408 the transmitter oscillator frequency being identical to the receiver local oscillator frequency
- 1/44 . . . Transmit/receive switching
- 1/46 by voice-frequency signals; by pilot signals
- 1/48 in circuits for connecting transmitter and receiver to a common transmission path, e.g. by energy of transmitter ([H04B 1/46 takes precedence](#))}
- 2001/485 {inhibiting unwanted transmission}
- 1/50 . . . using different frequencies for the two directions of communication
- 1/52 Hybrid arrangements, i.e. arrangements for transition from single-path two-direction transmission to single-direction transmission on each of two paths or vice versa
- 1/525 with means for reducing leakage of transmitter signal into the receiver
- 1/54 . . . using the same frequency for two directions of communication ([H04B 1/44 takes precedence](#))
- 1/56 with provision for simultaneous communication in two directions
- 1/58 Hybrid arrangements, i.e. arrangements for transition from single-path two-direction transmission to single-direction transmission on each of two paths or vice versa
- 1/581 {using a transformer}
- 1/582 {with automatic balancing}
- 1/583 {using a bridge network}
- 1/585 {with automatic balancing}
- 1/586 {using an electronic circuit}
- 1/587 {using opto-couplers ([light transmission systems H04B 10/00](#))}
- 1/588 {using sampling gates}
- 1/59 . Responders; Transponders
- 1/60 . Supervising unattended repeaters
- 1/62 . for providing a predistortion of the signal in the transmitter and corresponding correction in the receiver, e.g. for improving the signal/noise ratio
- 1/64 . . Volume compression or expansion arrangements
- 1/66 . for reducing bandwidth of signals; for improving efficiency of transmission ([H04B 1/68 takes precedence](#))
- 1/662 . . {using a time/frequency relationship, e.g. time compression or expansion}
- 1/665 . . {using psychoacoustic properties of the ear, e.g. masking effect}
- 1/667 . . {using a division in frequency subbands ([for TV signals H04N 19/63](#))}
- 1/68 . for wholly or partially suppressing the carrier or one side band
- 1/69 . Spread spectrum techniques
- 2001/6904 . . {using code hopping}
- 2001/6908 . . {using time hopping}
- 2001/6912 . . {using chirp}
- 2001/6916 . . {Related theory}
- 1/692 . . Hybrid techniques using combinations of two or more spread spectrum techniques
- 1/707 . . using direct sequence modulation
- 2001/70706 . . . {using a code tracking loop, e.g. a delay locked loop}
- 1/70712 . . . {with demodulation by means of convolvers, e.g. of the SAW type ([SAW convolvers in general G06G 7/195](#))}
- 1/70718 . . . {with asynchronous demodulation, i.e. not requiring code synchronisation}
- 2001/70724 . . . {featuring pilot assisted reception}
- 1/7073 . . . Synchronisation aspects
- 1/70735 {Code identification ([H04B 1/7083 takes precedence](#))}
- 1/7075 with code phase acquisition
- 1/70751 {using partial detection ([H04B 1/70758 takes precedence](#))}
- 1/70752 {Partial correlation}
- 1/70753 {Partial phase search}
- 1/70754 {Setting of search window, i.e. range of code offsets to be searched ([H04B 1/70758 takes precedence](#))}
- 1/70755 {Setting of lock conditions, e.g. threshold}

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| 1/70756 | | {Jumping within the code, i.e. masking or slewing (H04B 1/70758 takes precedence)} |
| 1/70757 | | {with increased resolution, i.e. higher than half a chip (H04B 1/70758 takes precedence)} |
| 1/70758 | | {Multimode search, i.e. using multiple search strategies} |
| 1/7077 | | Multi-step acquisition, e.g. multi-dwell, coarse-fine or validation |
| 1/70775 | | {Multi-dwell schemes, i.e. multiple accumulation times} |
| 1/708 | | Parallel implementation |
| 1/7083 | | Cell search, e.g. using a three-step approach |
| 1/7085 | | using a code tracking loop, e.g. a delay-locked loop |
| 2001/70855 | | {Dithering} |
| 1/7087 | | Carrier synchronisation aspects |
| 1/709 | | Correlator structure |
| 1/7093 | | Matched filter type |
| 2001/70935 | | {using a bank of matched filters, e.g. Fast Hadamard Transform} |
| 1/7095 | | Sliding correlator type |
| 1/7097 | | Interference-related aspects |
| 1/71 | | the interference being narrowband interference |
| 1/7101 | | {with estimation filters} |
| 1/7102 | | {with transform to frequency domain} |
| 1/7103 | | the interference being multiple access interference |
| 1/7105 | | Joint detection techniques, e.g. linear detectors |
| 1/71052 | | {using decorrelation matrix} |
| 1/71055 | | {using minimum mean squared error [MMSE] detector} |
| 1/71057 | | {using maximum-likelihood sequence estimation [MLSE]} |
| 1/7107 | | Subtractive interference cancellation |
| 1/71072 | | {Successive interference cancellation} |
| 1/71075 | | {Parallel interference cancellation} |
| 2001/71077 | | {Partial interference cancellation} |
| 1/711 | | the interference being multi-path interference |
| 1/7113 | | Determination of path profile |
| 1/7115 | | Constructive combining of multi-path signals, i.e. RAKE receivers |
| 1/7117 | | Selection, re-selection, allocation or re-allocation of paths to fingers, e.g. timing offset control of allocated fingers |
| 1/712 | | Weighting of fingers for combining, e.g. amplitude control or phase rotation using an inner loop |
| 1/713 | | using frequency hopping |
| 1/7136 | | Arrangements for generation of hop frequencies, e.g. using a bank of frequency sources, using continuous tuning or using a transform |
| 2001/71362 | | {using a bank of frequency sources} |
| 2001/71365 | | {using continuous tuning of a single frequency source} |
| 2001/71367 | | {using a transform} |
| 1/7143 | | Arrangements for generation of hop patterns |
| 1/715 | | Interference-related aspects |
| 2001/7152 | | {with means for suppressing interference} |
| 2001/7154 | | {with means for preventing interference} |
| 1/7156 | | Arrangements for sequence synchronisation |
| 2001/71563 | | {Acquisition} |
| 2001/71566 | | {Tracking} |
| 1/7163 | | using impulse radio |
| 1/71632 | | {Signal aspects (H04B 1/7172 and H04B 1/7176 take precedence)} |
| 1/71635 | | {Transmitter aspects (H04B 1/7174 takes precedence)} |
| 1/71637 | | {Receiver aspects (H04B 1/7183 takes precedence)} |
| 1/717 | | Pulse-related aspects |
| 1/7172 | | {Pulse shape (in general H04L 25/03834)} |
| 1/7174 | | {Pulse generation (in general H04L 25/03834)} |
| 1/7176 | | Data mapping, e.g. modulation |
| 1/7183 | | Synchronisation |
| 1/719 | | Interference-related aspects |
| 1/72 | | Circuits or components for simulating antennas, e.g. dummy antennas |
| 1/74 | | for increasing reliability, e.g. using redundant or spare channels or apparatus {(replacing by standby devices for amplifiers H03F 1/52 , H03F 1/542)} |
| 1/745 | | {using by-passing or self-healing methods} |
| 1/76 | | Pilot transmitters or receivers for control of transmission or for equalising |
| 3/00 | | Line transmission systems (combined with near-field transmission systems H04B 5/00) |
| 3/02 | | Details |
| 3/03 | | Hybrid circuits (for transceivers H04B 1/52 , H04B 1/58) |
| 3/04 | | Control of transmission; Equalising |
| 3/06 | | by the transmitted signal |
| 3/08 | | in negative-feedback path of line amplifier |
| 3/10 | | by pilot signal |
| 3/11 | | using pilot wire (H04B 3/12 takes precedence) |
| 3/12 | | in negative-feedback path of line amplifier |
| 3/14 | | characterised by the equalising network used |
| 3/141 | | {using multiequalisers, e.g. bump, cosine, Bode} |
| 3/142 | | {using echo-equalisers, e.g. transversal} |
| 3/143 | | {using amplitude-frequency equalisers} |
| 3/144 | | {fixed equalizers} |
| 3/145 | | {variable equalisers} |
| 3/146 | | {using phase-frequency equalisers} |
| 3/147 | | {fixed equalisers} |
| 3/148 | | {variable equalisers} |
| 3/16 | | characterised by the negative-impedance network used |
| 3/18 | | wherein the network comprises semiconductor devices |
| 3/20 | | Reducing echo effects or singing; Opening or closing transmitting path; Conditioning for transmission in one direction or the other |
| 3/21 | | using a set of bandfilters |
| 3/23 | | using a replica of transmitted signal in the time domain, e.g. echo cancellers |
| 3/231 | | {Echo cancellers using readout of a memory to provide the echo replica} |
| 3/232 | | {using phase shift, phase roll or frequency offset correction} |

- 3/234 {using double talk detection}
- 3/235 {combined with adaptive equaliser}
- 3/237 {using two adaptive filters, e.g. for near end and for end echo cancelling}
- 3/238 {using initial training sequence}
- 3/26 . . Improving frequency characteristic by the use of loading coils
- 3/28 . . Reducing interference caused by currents induced in cable sheathing or armouring
- 3/30 . . Reducing interference caused by unbalance current in a normally balanced line
- 3/32 . . Reducing cross-talk, e.g. by compensating
- 3/34 . . . by systematic interconnection of lengths of cable during laying; by addition of balancing components to cable during laying
- 3/36 . . Repeater circuits ([H04B 3/58 takes precedence](#))
- 3/38 . . . for signals in two different frequency ranges transmitted in opposite directions over the same transmission path
- 3/40 . . Artificial lines; Networks simulating a line of certain length
- 3/42 . . Circuits for by-passing of ringing signals
- 3/44 . . Arrangements for feeding power to a repeater along the transmission line
- 3/46 . . Monitoring; Testing
- 3/462 . . . Testing group delay or phase shift, e.g. timing jitter
- 3/466 Testing attenuation in combination with at least one of group delay and phase shift
- 3/48 . . . Testing attenuation ([H04B 3/466 takes precedence](#))
- 3/487 . . . Testing crosstalk effects
- 3/493 . . . Testing echo effects or singing
- 3/50 . Systems for transmission between fixed stations via two-conductor transmission lines ([H04B 3/54 takes precedence](#))
- 3/52 . Systems for transmission between fixed stations via waveguides
- 3/54 . Systems for transmission via power distribution lines
- 3/542 . . {the information being in digital form}
- 3/544 . . {Setting up communications; Call and signalling arrangements}
- 3/546 . . {Combination of signalling, telemetering, protection (circuits for remote indication of supply or distribution network condition [H02J 13/00](#))}
- 3/548 . . {the power on the line being DC (arrangements for feeding power [H04L 12/10](#); extracting feeding power from signals [H04L 25/02](#))}
- 3/56 . . Circuits for coupling, blocking, or by-passing of signals
- 3/58 . . Repeater circuits
- 3/60 . Systems for communication between relatively movable stations, e.g. for communication with lift ([H04B 3/54 takes precedence](#))
- 5/00 Near-field transmission systems, e.g. inductive loop type**
- 5/0006 . {using a receiver structurally associated with a loudspeaker or an earphone}
- 5/0012 . {using capacitive coupling}
- 5/0018 . {using leaky or radiating cables, e.g. leaky coaxial cables or power lines for inductive transmission (leaky cables [per se H01Q 13/20](#); for railways [B61L 3/22](#))}
- 5/0025 . {Near field system adaptations}
- 5/0031 . . {for data transfer}
- 5/0037 . . {for power transfer}
- 5/0043 . . {for taking measurements, e.g. using sensor coils}
- 5/005 . . {for isolation purposes}
- 5/0056 . {for use in interrogation, identification or read/write systems (record carriers [G06K 7/00](#), [G06K 19/00](#); for railways [B61L 3/12](#))}
- 5/0062 . . {in RFID [Radio Frequency Identification] Systems}
- 5/0068 . . {in transponders}
- 5/0075 . {using inductive coupling (transformers or inductances adapted for inductive coupling [H01F 38/14](#))}
- 5/0081 . . {with antenna coils (loop aerials [H01Q 7/00](#))}
- 5/0087 . . {with multiple coils at either side}
- 5/0093 . . {with one coil at each side, e.g. with primary and secondary coils}
- 5/02 . using transceiver
- 5/04 . Calling systems, e.g. paging system
- 5/06 . using a portable transmitter associated with a microphone
- 7/00 Radio transmission systems, i.e. using radiation field ([H04B 10/00](#), [H04B 15/00](#) take precedence)**
- 7/002 . {Reducing depolarization effects}
- 7/005 . Control of transmission; Equalising
- 7/01 . Reducing phase shift
- 7/015 . Reducing echo effects
- 7/02 . Diversity systems; Multi-antenna system, i.e. transmission or reception using multiple antennas ([RAKE receivers H04B 1/7115](#))
- 7/022 . . Site diversity; Macro-diversity (using two or more spaced independent antennas [H04B 7/04](#))
- 7/024 . . . Co-operative use of antennas of several sites, e.g. in co-ordinated multipoint or co-operative multiple-input multiple-output [MIMO] systems
- 7/026 . . . Co-operative diversity, e.g. using fixed or mobile stations as relays
- 7/028 . . {Spatial transmit diversity using a single antenna at the transmitter}
- 7/04 . . using two or more spaced independent antennas
- 7/0404 . . . the mobile station comprising multiple antennas, e.g. to provide uplink diversity
- 7/0408 . . . using two or more beams, i.e. beam diversity
- 7/0413 . . . MIMO systems
- 7/0417 Feedback systems
- 7/0421 {utilizing implicit feedback, e.g. steered pilot signals}
- 7/0426 Power distribution
- 7/043 {using best eigenmode, e.g. beam forming or beam steering}
- 7/0434 {using multiple eigenmodes}
- 7/0439 {utilizing channel inversion}
- 7/0443 {utilizing "waterfilling" technique}
- 7/0447 {utilizing uniform distribution}
- 7/0452 Multi-user MIMO systems

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| 7/0456 | | Selection of precoding matrices or codebooks, e.g. using matrices antenna weighting | 7/0654 | | {at the receiver, e.g. antenna verification at mobile station} |
| 7/046 | | {taking physical layer constraints into account} | 7/0656 | | {at the transmitter, e.g. error detection at base station} |
| 7/0465 | | {taking power constraints at power amplifier or emission constraints, e.g. constant modulus, into account} | 7/0658 | | {Feedback reduction} |
| 7/0469 | | {taking special antenna structures, e.g. cross polarized antennas into account} | 7/066 | | {Combined feedback for a number of channels, e.g. over several subcarriers like in orthogonal frequency division multiplexing [OFDM]} |
| 7/0473 | | {taking constraints in layer or codeword to antenna mapping into account} | 7/0663 | | {using vector or matrix manipulations} |
| 7/0478 | | {Special codebook structures directed to feedback optimization} | 7/0665 | | {Feed forward of transmit weights to the receiver} |
| 7/0482 | | {Adaptive codebooks} | 7/0667 | | {of delayed versions of same signal (using space-time coding H04L 1/0618)} |
| 7/0486 | | {taking channel rank into account} | 7/0669 | | {using different channel coding between antennas (space-time coding H04L 1/0618)} |
| 7/0491 | | using two or more sectors, i.e. sector diversity | 7/0671 | | {using different delays between antennas} |
| 7/0495 | | using overlapping sectors in the same base station to implement MIMO for antennas | 7/0673 | | {using feedback from receiving side} |
| 7/06 | | at the transmitting station | 7/0676 | | {using random or pseudo-random delays} |
| 7/0602 | | {using antenna switching (H04B 7/0686 takes precedence; antenna beam directivity switching H01Q 3/24)} | 7/0678 | | {using different spreading codes between antennas (code allocation H04J 13/16)} |
| 7/0604 | | {with predefined switching scheme} | 7/068 | | {using space frequency diversity (space-frequency coding H04L 1/0606)} |
| 7/0606 | | {Random or pseudo-random switching scheme} | 7/0682 | | {using phase diversity (e.g. phase sweeping)} |
| 7/0608 | | {Antenna selection according to transmission parameters} | 7/0684 | | {using different training sequences per antenna} |
| 7/061 | | {using feedback from receiving side} | 7/0686 | | {Hybrid systems, i.e. switching and simultaneous transmission} |
| 7/0613 | | {using simultaneous transmission (H04B 7/0686 takes precedence)} | 7/0689 | | {using different transmission schemes, at least one of them being a diversity transmission scheme} |
| 7/0615 | | {of weighted versions of same signal} | 7/0691 | | {using subgroups of transmit antennas} |
| 7/0617 | | {for beam forming} | 7/0693 | | {switching off a diversity branch, e.g. to save power} |
| 7/0619 | | {using feedback from receiving side (feedback signaling for adaptive modulation/coding H04L 1/0001)} | 7/0695 | | {using beam selection} |
| 7/0621 | | {Feedback content} | 7/0697 | | {using spatial multiplexing} |
| 7/0623 | | {Auxiliary parameters, e.g. power control [PCB] or not acknowledged commands [NACK], used as feedback information} | 7/08 | | at the receiving station |
| 7/0626 | | {Channel coefficients, e.g. channel state information [CSI]} | 7/0802 | | {using antenna selection (H04B 7/0868 takes precedence; antenna beam directivity switching H01Q 3/24)} |
| 7/0628 | | {Diversity capabilities} | 7/0805 | | {with single receiver and antenna switching (H04B 7/0822 takes precedence)} |
| 7/063 | | {Parameters other than those covered in groups H04B 7/0623 - H04B 7/0634 , e.g. channel matrix rank or transmit mode selection} | 7/0808 | | {comparing all antennas before reception} |
| 7/0632 | | {Channel quality parameters, e.g. channel quality indicator [CQI]} | 7/0811 | | {during preamble or gap period} |
| 7/0634 | | {Antenna weights or vector/matrix coefficients} | 7/0814 | | {based on current reception conditions, e.g. switching to different antenna when signal level is below threshold} |
| 7/0636 | | {Feedback format} | 7/0817 | | {with multiple receivers and antenna path selection} |
| 7/0639 | | {Using selective indices, e.g. of a codebook, e.g. pre-distortion matrix index [PMI] or for beam selection} | 7/082 | | {selecting best antenna path} |
| 7/0641 | | {Differential feedback} | 7/0822 | | {according to predefined selection scheme} |
| 7/0643 | | {Feedback on request} | 7/0825 | | {with main and with auxiliary or diversity antennas} |
| 7/0645 | | {Variable feedback} | 7/0828 | | {with delay elements in antenna paths} |
| 7/0647 | | {Variable feedback rate} | | | |
| 7/065 | | {Variable contents, e.g. long-term or short-short} | | | |
| 7/0652 | | {Feedback error handling} | | | |

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|--------|-----------|--|---------|-----------|---|
| 7/0831 | | { Compensation of the diversity switching process for non-uniform properties or faulty operations of the switches used in the diversity switching process } | 7/15507 | | { Relay station based processing for cell extension or control of coverage area, (network planning with network coordinated processing with regard to cell extension H04W 16/26 ; network topologies using dedicated repeater stations H04W 84/047 ; terminal devices adapted for relaying to or from an other terminal H04W 88/04) } |
| 7/0834 | | { based on external parameters, e.g. subscriber speed or location } | 7/15514 | | { for shadowing compensation (for satellite mobile telephony service systems H04B 7/18536) } |
| 7/0837 | | { using pre-detection combining (H04B 7/0868 takes precedence) } | 7/15521 | | { combining by calculations packets received from different stations before transmitting the combined packets as part of network coding (network coding aspects for detection or prevention of errors in the information received H04L 1/0076 ; network traffic management with optimizing of information sizing, e.g. header compression, by using assembly and disassembly of packets H04W 28/065) } |
| 7/084 | | { Equal gain combining, only phase adjustments (antenna beam scanning or forming by phase or amplitude control H01Q 3/26 , e.g. phased arrays) } | 7/15528 | | { Control of operation parameters of a relay station to exploit the physical medium } |
| 7/0842 | | { Weighted combining } | 7/15535 | | { Control of relay amplifier gain (amplifier gain control in general H03G 3/00 ; gain control reducing self - or loop interference H04B 7/15578) } |
| 7/0845 | | { per branch equalization, e.g. by an FIR-filter or RAKE receiver per antenna branch (rake receivers as such H04B 1/7115) } | 7/15542 | | { Selecting at relay station its transmit and receive resources (selection of wireless resources by user or terminal H04W 72/02 ; arrangements affording multiple use of the transmission path by two-dimensional division of the resources H04L 5/0003 , or by allocating sub-channels H04L 5/003) } |
| 7/0848 | | { Joint weighting } | 7/1555 | | { Selecting relay station antenna mode, e.g. selecting omnidirectional -, directional beams, selecting polarizations } |
| 7/0851 | | { using training sequences or error signal (minimizing error signal H04B 7/0854) } | 7/15557 | | { Selecting relay station operation mode, e.g. between amplify and forward mode, decode and forward mode or FDD - and TDD mode } |
| 7/0854 | | { using error minimizing algorithms, e.g. minimum mean squared error [MMSE], "cross-correlation" or matrix inversion } | 7/15564 | | { Relay station antennae loop interference reduction } |
| 7/0857 | | { using maximum ratio combining techniques, e.g. signal-to- interference ratio [SIR], received signal strenght indication [RSS] } | 7/15571 | | { by signal isolation, e.g. isolation by frequency or by antenna pattern, or by polarization } |
| 7/086 | | { using weights depending on external parameters, e.g. direction of arrival [DOA], predetermined weights or beamforming } | 7/15578 | | { by gain adjustment } |
| 7/0862 | | { receiver computing weights based on information from the transmitter } | 7/15585 | | { by interference cancellation } |
| 7/0865 | | { Independent weighting, i.e. weights based on own antenna reception parameters } | 7/15592 | | { Adapting at the relay station communication parameters for supporting cooperative relaying, i.e. transmission of the same data via direct - and relayed path (cooperative diversity H04B 7/024) } |
| 7/0868 | | { Hybrid systems, i.e. switching and combining } | 7/165 | | employing angle modulation |
| 7/0871 | | { using different reception schemes, at least one of them being a diversity reception scheme } | 7/17 | | employing pulse modulation, e.g. pulse code modulation |
| 7/0874 | | { using subgroups of receive antennas } | 7/185 | | Space-based or airborne stations; { Stations for satellite systems } (H04B 7/204 takes precedence) |
| 7/0877 | | { switching off a diversity branch, e.g. to save power } | 7/18502 | | { Airborne stations } |
| 7/088 | | { using beam selection } | 7/18504 | | { Aircraft used as relay or high altitude atmospheric platform } |
| 7/0882 | | { using post-detection diversity } | 7/18506 | | { Communications with or from aircraft, i.e. aeronautical mobile service } |
| 7/0885 | | { with combination } | | | |
| 7/0888 | | { with selection } | | | |
| 7/0891 | | { Space-time diversity (rake receivers H04B 1/7115 ; space-time decoding H04L 1/0631) } | | | |
| 7/0894 | | { using different delays between antennas } | | | |
| 7/0897 | | { using beamforming per multi-path, e.g. to cope with different directions of arrival [DOA] at different multi-paths } | | | |
| 7/10 | | Polarisation diversity; Directional diversity | | | |
| 7/12 | | Frequency diversity | | | |
| 7/14 | | Relay systems | | | |
| 7/145 | | Passive relay systems | | | |
| 7/15 | | Active relay systems | | | |
| 7/155 | | Ground-based stations (H04B 7/204 takes precedence) | | | |

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|-------------------|--|-------------------|---|
| 7/18508 | { with satellite system used as relay, i.e. aeronautical mobile satellite service } | 7/18552 | { using a telephonic control signal and a second ranging satellite (determining absolute distances from a plurality of spaced points of known location G01S 5/14) } |
| 7/1851 | { Systems using a satellite or space-based relay (H04B 7/18508 , H04B 7/18521 take precedence; providing specific services H04B 7/18523 - H04B 7/18576) } | 7/18554 | { using the position provided by an existing geolocalisation system } |
| 7/18513 | { Transmission in a satellite or space-based system } | 7/18556 | { using a location database } |
| 7/18515 | { Transmission equipment in satellites or space-based relays } | 7/18558 | { Arrangements for managing communications, i.e. for setting up, maintaining or releasing a call between stations } |
| 7/18517 | { Transmission equipment in earth stations } | 7/1856 | { for call routing } |
| 7/18519 | { Operations control, administration or maintenance } | 7/18563 | { Arrangements for interconnecting multiple systems (data switching networks H04L 12/00) } |
| 7/18521 | { Systems of inter linked satellites, i.e. inter satellite service (for optical links between satellites H04B 10/118) } | 7/18565 | { Arrangements for preventing unauthorised access or for providing user protection (arrangements for secret or secure communication H04L 9/00) } |
| 7/18523 | { Satellite systems for providing broadcast service to terrestrial stations, i.e. broadcast satellite service (arrangements specially adapted for satellite broadcast receiving H04H 40/90 ; picture transmission via satellite H04N 1/00103 ; television transmission via satellite H04N 7/20) } | 7/18567 | { Arrangements for providing additional services to the basic mobile satellite telephony service } |
| 7/18526 | { Arrangements for data linking, networking or transporting, or for controlling an end to end session (data switching networks H04L 12/00) } | 7/18569 | { Arrangements for system physical machines management, i.e. for construction operations control, administration, maintenance } |
| 7/18528 | { Satellite systems for providing two-way communications service to a network of fixed stations, i.e. fixed satellite service or very small aperture terminal [VSAT] system } | 7/18571 | { for satellites; for fixed or mobile stations } |
| 7/1853 | { Satellite systems for providing telephony service to a mobile station, i.e. mobile satellite service (for selecting H04W) } | 7/18573 | { for operations control, administration or maintenance } |
| 7/18532 | { Arrangements for managing transmission, i.e. for transporting data or a signalling message } | 7/18576 | { Satellite systems for providing narrowband data service to fixed or mobile stations, e.g. using a minisatellite, a microsatellite (for selecting H04W) } |
| 7/18534 | { for enhancing link reliability, e.g. satellites diversity } | 7/18578 | { Satellite systems for providing broadband data service to individual earth stations (for selecting H04W ; provisions for broadband connection, H04Q 11/0478) } |
| 7/18536 | { Shadowing compensation therefor, e.g. by using an additional terrestrial relay } | 7/1858 | { Arrangements for data transmission on the physical system, i.e. for data bit transmission between network components } |
| 7/18539 | { Arrangements for managing radio, resources, i.e. for establishing or releasing a connection } | 7/18582 | { Arrangements for data linking, i.e. for data framing, for error recovery, for multiple access } |
| 7/18541 | { for handover of resources } | 7/18584 | { Arrangements for data networking, i.e. for data packet routing, for congestion control (data switching networks H04L 12/00) } |
| 7/18543 | { for adaptation of transmission parameters, e.g. power control (for detecting or preventing errors in the information received H04L 1/00) } | 7/18586 | { Arrangements for data transporting, e.g. for an end to end data transport or check } |
| 7/18545 | { Arrangements for managing station mobility, i.e. for station registration or localisation } | 7/18589 | { Arrangements for controlling an end to end session, i.e. for initialising, synchronising or terminating an end to end link } |
| 7/18547 | { for geolocalisation of a station (position fixing by direction or distance determination G01S 5/00) } | 7/18591 | { Arrangements for interconnecting multiple systems (data switching networks H04L 12/00) } |
| 7/1855 | { using a telephonic control signal, e.g. propagation delay variation, Doppler frequency variation, power variation, beam identification } | 7/18593 | { Arrangements for preventing unauthorised access or for providing user protection (arrangements for secret or secure communication H04L 9/00) } |
| | | 7/18595 | { Arrangements for adapting broadband applications to satellite systems } |

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| 7/18597 | {Arrangements for system physical machines management, i.e. for construction, operations control, administration, maintenance} | 7/2662 | {Arrangements for Wireless System Synchronisation} |
| 7/19 | Earth-synchronous stations | 7/2665 | {Arrangements for Wireless Frequency Division Multiple Access [FDMA] System Synchronisation} |
| 7/195 | Non-synchronous stations | 7/2668 | {Arrangements for Wireless Code-Division Multiple Access [CDMA] System Synchronisation, (for code acquisition H04B 1/7075 , for code tracking H04B 1/7085)} |
| 7/204 | Multiple access | 7/2671 | {Arrangements for Wireless Time-Division Multiple Access [TDMA] System Synchronisation} |
| 7/2041 | {Spot beam multiple access} | 7/2675 | {Frequency synchronisation} |
| 7/2043 | {Mixed mode, TDM and FDM systems} | 7/2678 | {Time synchronisation} |
| 7/2045 | {SS-FDMA, FDMA satellite switching} | 7/2681 | {Synchronisation of a mobile station with one base station} |
| 7/2046 | {SS-TDMA, TDMA satellite switching} | 7/2684 | {Synchronisation of a mobile station with more than one base station} |
| 7/2048 | {Frame structure, synchronisation or frame acquisition in SS-TDMA systems} | 7/2687 | {Inter base stations synchronisation} |
| 7/208 | Frequency-division multiple access {[FDMA]} | 7/269 | {Master/slave synchronisation} |
| 7/212 | Time-division multiple access {[TDMA]} | 7/2693 | {Centralised synchronisation, i.e. using external universal time reference, e.g. by using a global positioning system [GPS] or by distributing time reference over the wireline network} |
| 7/2121 | {Channels assignment to the different stations} | 7/2696 | {Over the air autonomous synchronisation, e.g. by monitoring network activity (H04B 7/2693 takes precedence)} |
| 7/2123 | {Variable assignment, e.g. demand assignment} | | |
| 7/2125 | {Synchronisation} | | |
| 7/2126 | {using a reference station} | | |
| 7/2128 | {Changing of the reference station} | | |
| 7/216 | Code division or spread-spectrum multiple access {[CDMA, SSMA]} | | |
| 7/22 | . Scatter propagation systems {, e.g. ionospheric, tropospheric or meteor scatter} | | |
| 7/24 | . for communication between two or more posts (wireless communication networks H04W) | | |
| 7/26 | . . at least one of which is mobile | | |
| 7/2603 | . . . {Arrangements for wireless physical layer control (H04B 7/2612 takes precedence)} | | |
| 7/2606 | {Arrangements for base station coverage control, e.g. by using relays in tunnels} | | |
| 7/2609 | {Arrangements for range control, e.g. by using remote antennas} | | |
| 7/2612 | . . . {Arrangements for wireless medium access control, e.g. by allocating physical layer transmission capacity (H04B 7/2615 - H04B 7/2643 take precedence; provision for broadband connection H04Q 11/0478)} | | |
| 7/2615 | . . . {using hybrid frequency-time division multiple access [FDMA-TDMA]} | | |
| 7/2618 | . . . {using hybrid code-time division multiple access [CDMA-TDMA]} | | |
| 7/2621 | . . . {using frequency division multiple access [FDMA] (H04B 7/2615 takes precedence)} | | |
| 7/2625 | . . . {using common wave} | | |
| 7/2628 | . . . {using code-division multiple access [CDMA] or spread spectrum multiple access [SSMA] (H04B 7/2618 takes precedence)} | | |
| 7/2631 | {for broadband transmission} | | |
| 7/2634 | {for channel frequency control} | | |
| 7/2637 | {for logical channel control} | | |
| 7/264 | {for data rate control} | | |
| 7/2643 | . . . {using time-division multiple access [TDMA] (H04B 7/2615 , H04B 7/2618 take precedence)} | | |
| 7/2646 | {for broadband transmission} | | |
| 7/265 | {for channel frequency control} | | |
| 7/2653 | {for logical channel control} | | |
| 7/2656 | {for structure of frame, burst} | | |
| 7/2659 | {for data rate control} | | |
| | | 10/00 | Transmission systems employing electromagnetic waves other than radio-waves, e.g. infrared, visible or ultraviolet light, or employing corpuscular radiation, e.g. quantum communication |
| | | | NOTE |
| | | | In this group, non-optical transmission systems are classified in group H04B 10/90 . |
| | | 10/03 | . Arrangements for fault recovery |
| | | 10/032 | . . using working and protection systems {(H04J 14/0287 takes precedence)} |
| | | 10/035 | . . using loopbacks |
| | | 10/038 | . . using bypasses |
| | | 10/07 | . Arrangements for monitoring or testing transmission systems; Arrangements for fault measurement of transmission systems |
| | | 10/071 | . . using a reflected signal, e.g. using optical time-domain reflectometers [OTDRs] |
| | | 10/073 | . . using an out-of-service signal (H04B 10/071 takes precedence) |
| | | 10/0731 | . . . {Testing or characterisation of optical devices, e.g. amplifiers} |
| | | 10/075 | . . using an in-service signal (H04B 10/071 takes precedence) |
| | | 10/077 | . . . using a supervisory or additional signal |
| | | 10/0771 | {Fault location on the transmission path} |
| | | 10/0773 | {Network aspects, e.g. central monitoring of transmission parameters} |
| | | 10/0775 | {Performance monitoring and measurement of transmission parameters} |
| | | 10/0777 | {Monitoring line amplifier or line repeater equipment} |

- 10/0779 {Monitoring line transmitter or line receiver equipment}
- 10/079 . . . using measurements of the data signal
- 10/0791 {Fault location on the transmission path}
- 10/0793 {Network aspects, e.g. central monitoring of transmission parameters}
- 10/0795 {Performance monitoring; Measurement of transmission parameters}
- 10/07951 {Monitoring or measuring chromatic dispersion or PMD}
- 10/07953 {Monitoring or measuring OSNR, BER or Q}
- 10/07955 {Monitoring or measuring power}
- 10/07957 {Monitoring or measuring wavelength}
- 10/0797 {Monitoring line amplifier or line repeater equipment}
- 10/0799 {Monitoring line transmitter or line receiver equipment}
- 10/11 . Arrangements specific to free-space transmission, i.e. transmission through air or vacuum
- 10/112 . . Line-of-sight transmission over an extended range
- 10/1121 . . . {One-way transmission}
- 10/1123 . . . {Bidirectional transmission}
- 10/1125 {using a single common optical path}
- 10/1127 {using two distinct parallel optical paths}
- 10/1129 . . . {Arrangements for outdoor wireless networking of information}
- 10/114 . . Indoor or close-range type systems
- 10/1141 . . . {One-way transmission}
- 10/1143 . . . {Bidirectional transmission}
- 10/1149 . . . {Arrangements for indoor wireless networking of information}
- 10/116 . . . Visible light communication
- 10/118 . . specially adapted for satellite communication
- 10/25 . Arrangements specific to fibre transmission
- 10/2507 . . for the reduction or elimination of distortion or dispersion
- 10/25073 . . . {using spectral equalisation, e.g. spectral filtering}
- 10/25077 . . . {using soliton propagation}
- 10/2513 . . . due to chromatic dispersion
- 10/25133 {including a lumped electrical or optical dispersion compensator ([H04B 10/2519](#), [H04B 10/2525](#) takes precedence)}
- 10/25137 {using pulse shaping at the transmitter, e.g. pre-chirping or dispersion supported transmission [DST]}
- 10/2519 using Bragg gratings
- 10/2525 using dispersion-compensating fibres
- 10/25253 {with dispersion management, i.e. using a combination of different kind of fibres in the transmission system}
- 10/2531 using spectral inversion
- 10/2537 . . . due to scattering processes, e.g. Raman or Brillouin scattering
- 10/2543 . . . due to fibre non-linearities, e.g. Kerr effect
- 10/255 Self-phase modulation [SPM]
- 10/2557 Cross-phase modulation [XPM]
- 10/2563 Four-wave mixing [FWM]
- 10/2569 . . . due to polarisation mode dispersion [PMD]
- 10/2572 . . . {due to forms of polarisation-dependent distortion other than PMD}
- 10/2575 . . Radio-over-fibre, e.g. radio frequency signal modulated onto an optical carrier
- 10/25751 {Optical arrangements for CATV or video distribution ([adaptations of television systems for optical transmission H04N 7/22](#))}
- 10/25752 {Optical arrangements for wireless networks}
- 10/25753 {Distribution optical network, e.g. between a base station and a plurality of remote units}
- 10/25754 {Star network topology}
- 10/25755 {Ring network topology}
- 10/25756 {Bus network topology}
- 10/25758 {between a central unit and a single remote unit by means of an optical fibre}
- 10/25759 {Details of the reception of RF signal or the optical conversion before the optical fibre}
- 10/2581 . . Multimode transmission
- 10/2587 . . using a single light source for multiple stations
- 10/2589 . . {Bidirectional transmission}
- 10/25891 . . . {Transmission components ([H04B 10/40](#) takes precedence)}
- 10/27 . Arrangements for networking
- 10/271 . . {Combination of different networks, e.g. star and ring configuration in the same network or two ring networks interconnected}
- 10/272 . . Star-type networks {or tree-type networks}
- 10/2725 . . . {Star-type networks without a headend}
- 10/275 . . Ring-type networks
- 10/2755 . . . {Ring-type networks with a headend}
- 10/278 . . Bus-type networks
- 10/29 . Repeaters
- 10/291 . . in which processing or amplification is carried out without conversion of the main signal from optical form
- 10/2912 . . . {characterised by the medium used for amplification or processing}
- 10/2914 {using lumped semiconductor optical amplifiers [SOA]}
- 10/2916 {using Raman or Brillouin amplifiers}
- 10/293 . . . Signal power control
- 10/2931 {using AGC ([H04B 10/294](#) takes precedence)}
- 10/2933 {considering the whole optical path}
- 10/2935 {with a cascade of amplifiers}
- 10/2937 {Systems with a repeater placed only at the beginning or the end of the system, i.e. repeaterless systems, e.g. systems with only post and pre-amplification}
- 10/2939 {Network aspects}
- 10/294 in a multiwavelength system, e.g. gain equalisation
- 10/2941 {using an equalising unit, e.g. a filter ([H04B 10/296](#) takes precedence)}
- 10/2942 {using automatic gain control [AGC] ([H04B 10/296](#) takes precedence)}
- 10/296 Transient power control, e.g. due to channel add/drop or rapid fluctuations in the input power
- 10/297 . . . Bidirectional amplification
- 10/2971 {A single amplifier for both directions}
- 10/2972 {Each direction being amplified separately}
- 10/298 . . . {Two-way repeaters, i.e. repeaters amplifying separate upward and downward lines}

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| 10/299 | . . . Signal waveform processing, e.g. reshaping or retiming | 10/613 | . . . {including phase diversity, e.g., having in-phase and quadrature branches, as in QPSK coherent receivers} |
| 10/40 | . Transceivers | 10/614 | . . . {comprising one or more polarization beam splitters, e.g. polarization multiplexed [PolMux] X-PSK coherent receivers, polarization diversity heterodyne coherent receivers (H04J 14/06 takes precedence)} |
| 10/43 | . . using a single component as both light source and receiver, e.g. using a photoemitter as a photoreceiver | 10/615 | . . . {Arrangements affecting the optical part of the receiver} |
| 10/50 | . Transmitters | 10/6151 | {comprising a polarization controller at the receiver's input stage} |
| 10/501 | . . {Structural aspects} | 10/616 | . . . {Details of the electronic signal processing in coherent optical receivers} |
| 10/502 | . . . {LED transmitters} | 10/6161 | {Compensation of chromatic dispersion} |
| 10/503 | . . . {Laser transmitters} | 10/6162 | {Compensation of polarization related effects, e.g., PMD, PDL} |
| 10/504 | {using direct modulation} | 10/6163 | {Compensation of non-linear effects in the fiber optic link, e.g. self-phase modulation [SPM], cross-phase modulation [XPM], four wave mixing [FWM]} |
| 10/505 | {using external modulation} | 10/6164 | {Estimation or correction of the frequency offset between the received optical signal and the optical local oscillator} |
| 10/5051 | {using a series, i.e. cascade, combination of modulators} | 10/6165 | {Estimation of the phase of the received optical signal, phase error estimation or phase error correction} |
| 10/5053 | {using a parallel, i.e. shunt, combination of modulators} | 10/6166 | {Polarisation demultiplexing, tracking or alignment of orthogonal polarisation components} |
| 10/5055 | {using a pre-coder} | 10/63 | . . . Homodyne {, i.e. coherent receivers where the local oscillator is locked in frequency and phase to the carrier signal} |
| 10/5057 | {using a feedback signal generated by analysing the optical output} | 10/64 | . . . Heterodyne {, i.e. coherent receivers where, after the opto-electronic conversion, an electrical signal at an intermediate frequency [fIF] is obtained} |
| 10/50572 | {to control the modulating signal amplitude including amplitude distortion} | 10/65 | . . . {Intradyne, i.e. coherent receivers with a free running local oscillator having a frequency close but not phase-locked to the carrier signal} |
| 10/50575 | {to control the modulator DC bias} | 10/66 | . . Non-coherent receivers, e.g. using direct detection |
| 10/50577 | {to control the phase of the modulating signal} | 10/67 | . . . Optical arrangements in the receiver |
| 10/5059 | {using a feed-forward signal generated by analysing the optical or electrical input} | 10/671 | {for controlling the input optical signal} |
| 10/50593 | {to control the modulating signal amplitude including amplitude distortion} | 10/672 | {for controlling the power of the input optical signal} |
| 10/50595 | {to control the modulator DC bias} | 10/673 | {using an optical preamplifier} |
| 10/50597 | {to control the phase of the modulating signal} | 10/674 | {using a variable optical attenuator} |
| 10/506 | . . . {Multiwavelength transmitters} | 10/675 | {for controlling the optical bandwidth of the input signal, e.g. spectral filtering} |
| 10/508 | . . Pulse generation, e.g. generation of solitons | 10/676 | {for all-optical demodulation of the input optical signal} |
| 10/516 | . . Details of coding or modulation | 10/677 | {for differentially modulated signal, e.g. DPSK signals} |
| 10/5161 | . . . {Combination of different modulation schemes} | 10/69 | . . . Electrical arrangements in the receiver |
| 10/5162 | . . . {Return-to-zero modulation schemes} | 10/691 | {Arrangements for optimizing the photodetector in the receiver} |
| 10/5165 | . . . {Carrier suppressed; Single sideband; Double sideband or vestigial} | 10/6911 | {Photodiode bias control, e.g. for compensating temperature variations} |
| 10/5167 | . . . {Duo-binary; Alternative mark inversion; Phase shaped binary transmission} | 10/693 | {Arrangements for optimizing the preamplifier in the receiver} |
| 10/524 | . . . Pulse modulation | 10/6931 | {Automatic gain control of the preamplifier} |
| 10/532 | . . . Polarisation modulation | 10/6932 | {Bandwidth control of bit rate adaptation} |
| 10/54 | . . . Intensity modulation | | |
| 10/541 | {Digital intensity or amplitude modulation} | | |
| 10/548 | . . . Phase or frequency modulation | | |
| 10/556 | Digital modulation, e.g. differential phase shift keying [DPSK] or frequency shift keying [FSK] | | |
| 10/5561 | {Digital phase modulation} | | |
| 10/5563 | {Digital frequency modulation} | | |
| 10/564 | . . Power control | | |
| 10/572 | . . Wavelength control | | |
| 10/58 | . . Compensation for non-linear transmitter output | | |
| 10/588 | . . . in external modulation systems | | |
| 10/60 | . Receivers | | |
| 10/61 | . . Coherent receivers | | |
| 10/612 | . . . {for optical signals modulated with a format different from binary or higher-order PSK [X-PSK], e.g. QAM, DPSK, FSK, MSK, ASK} | | |

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| 10/6933 | {Offset control of the differential preamplifier} | 14/062 | . . . {using delta modulation or one-bit differential modulation [1DPCM]} |
| 10/695 | {Arrangements for optimizing the decision element in the receiver, e.g. by using automatic threshold control} | 14/064 | {with adaptive feedback} |
| 10/697 | {Arrangements for reducing noise and distortion} | 14/066 | . . . {using differential modulation with several bits [NDPCM]} |
| 10/6971 | {using equalisation} | 14/068 | {with adaptive feedback} |
| 10/6972 | {using passive filtering} | 14/08 | . characterised by the use of a sub-carrier |
| 10/6973 | {using noise matching networks} | 15/00 | Suppression or limitation of noise or interference (by means associated with receiver H04B 1/10) |
| 10/70 | . Photonic quantum communication | 15/005 | . {Reducing noise, e.g. humm, from the supply} |
| 10/80 | . Optical aspects relating to the use of optical transmission for specific applications, not provided for in groups H04B 10/03 - H04B 10/70 , e.g. optical power feeding or optical transmission through water | 15/02 | . Reducing interference from electric apparatus by means located at or near the interfering apparatus |
| 10/801 | . . {using optical interconnects, e.g. light coupled isolators, circuit board interconnections} | 15/025 | . . {Reducing interference from ignition apparatus of fuel engines (cables with high resistance H01B)} |
| 10/802 | . . . {for isolation, e.g. using optocouplers} | 15/04 | . . the interference being caused by substantially sinusoidal oscillations, e.g. in a receiver or in a tape-recorder |
| 10/803 | . . . {Free space interconnects, e.g. between circuit boards or chips} | 15/06 | . . . by local oscillators of receivers |
| 10/806 | . . {Arrangements for feeding power} | 17/00 | Monitoring; Testing (of line transmission systems H04B 3/46; arrangements for monitoring or testing transmission systems employing electromagnetic waves other than radio waves H04B 10/07) |
| 10/807 | . . . {Optical power feeding, i.e. transmitting power using an optical signal} | 17/0082 | . {using service channels; using auxiliary channels} |
| 10/808 | . . . {Electrical power feeding of an optical transmission system} | 17/0085 | . . {using test signal generators} |
| 10/85 | . . Protection from unauthorised access, e.g. eavesdrop protection | 17/0087 | . . {using auxiliary channels or channel simulators} |
| 10/90 | . Non-optical transmission systems, e.g. transmission systems employing non-photonic corpuscular radiation | 17/10 | . of transmitters |
| 11/00 | Transmission systems employing sonic, ultrasonic or infrasonic waves | 17/101 | . . {for measurement of parameters} |
| 13/00 | Transmission systems characterised by the medium used for transmission, not provided for in groups H04B 3/00 - H04B 11/00 | 17/102 | . . . {of radiated power at antenna port} |
| 13/005 | . {Transmission systems in which the medium consists of the human body} | 17/103 | . . . {of reflected power, e.g. return loss} |
| 13/02 | . Transmission systems in which the medium consists of the earth or a large mass of water thereon, e.g. earth telegraphy | 17/104 | . . . {of other parameters, e.g. DC offset, delay or propagation times} |
| 14/00 | Transmission systems not characterised by the medium used for transmission (details thereof H04B 1/00) | 17/11 | . . for calibration |
| 14/002 | . {characterised by the use of a carrier modulation (using subcarrier modulation H04B 14/08)} | 17/12 | . . . of transmit antennas, e.g. of the amplitude or phase |
| 14/004 | . . {Amplitude modulation} | 17/13 | . . . of power amplifiers, e.g. gain or non-linearity |
| 14/006 | . . {Angle modulation} | 17/14 | . . . of the whole transmission and reception path, e.g. self-test loop-back |
| 14/008 | . . {Polarisation modulation} | 17/15 | . . Performance testing |
| 14/02 | . characterised by the use of pulse modulation (in radio transmission relays H04B 7/17) | 17/16 | . . . Test equipment located at the transmitter |
| 14/023 | . . {using pulse amplitude modulation} | 17/17 | . . . Detection of non-compliance or faulty performance, e.g. response deviations (H04B 17/18 takes precedence) |
| 14/026 | . . {using pulse time characteristics modulation, e.g. width, position, interval} | 17/18 | . . . Monitoring during normal operation |
| 14/04 | . . using pulse code modulation | 17/19 | . . . Self-testing arrangements |
| 14/042 | . . . {Special circuits, e.g. comparators} | 17/20 | . of receivers |
| 14/044 | . . . {Sample and hold circuits (in general G11C 27/02)} | 17/21 | . . for calibration; for correcting measurements |
| 14/046 | . . . {Systems or methods for reducing noise or bandwidth} | 17/23 | . . Indication means, e.g. displays, alarms, audible means |
| 14/048 | {Non linear compression or expansion} | 17/24 | . . with feedback of measurements to the transmitter |
| 14/06 | . . using differential modulation, e.g. delta modulation | 17/26 | . . using historical data, averaging values or statistics |
| | | 17/27 | . . for locating or positioning the transmitter |
| | | 17/29 | . . Performance testing |
| | | 17/30 | . of propagation channels |
| | | 17/309 | . . Measuring or estimating channel quality parameters |
| | | 17/318 | . . . Received signal strength |
| | | 17/327 | Received signal code power [RSCP] |
| | | 17/336 | . . . Signal-to-interference ratio [SIR] or carrier-to-interference ratio [CIR] |
| | | 17/345 | . . . Interference values (H04B 17/336 takes precedence) |
| | | 17/354 | . . . Adjacent channel leakage power |

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| 17/364 | . . . Delay profiles | 2201/709745 | Iterative interference mitigation schemes |
| 17/373 | . . Predicting channel quality parameters | 2201/709754 | Blind joint detection |
| 17/382 | . . for resource allocation, admission control or handover | 2201/709763 | Joint detection using feedback |
| 17/391 | . . Modelling the propagation channel | 2201/709772 | Joint detection using feedforward |
| 17/3911 | . . . {Fading models or fading generators} | 2201/709781 | Linear detectors for joint detection |
| 17/3912 | . . . {Simulation models} | 2201/70979 | Fat finger issues in RAKE receivers |
| 17/3913 | . . . {Predictive models} | 2201/713 | . . Frequency hopping |
| 17/40 | . of relay systems | 2201/71307 | . . . Partial band interference |
| 17/401 | . . {with selective localization} | 2201/71315 | . . . Wide band interference |
| 17/402 | . . . {using different frequencies} | 2201/71323 | . . . Adaptive systems |
| 17/403 | {generated by local oscillators} | 2201/7133 | . . . Asymmetric systems |
| 17/404 | {selected by local filters} | 2201/71338 | . . . Asynchronous systems |
| 17/405 | {generated by local multipliers, dividers, modulators} | 2201/71346 | . . . Bluetooth |
| 17/406 | . . . {using coded addresses} | 2201/71353 | . . . Fast frequency hopping |
| 17/407 | . . {without selective localization} | 2201/71361 | . . . Slow frequency hopping |
| 17/408 | . . . {using successive loop-backs} | 2201/71369 | . . . OFCHM |
| 17/409 | . . . {by means of resistance, voltage or current measurement} | 2201/71376 | . . . Threshold |
| | | 2201/71384 | . . . Look-up tables |
| | | 2201/7163 | . . Orthogonal indexing scheme relating to impulse radio |
| | | 2201/71632 | . . . Diversity |
| | | 2201/71634 | . . . Applied to ranging |
| | | 2201/71636 | . . . Transmitted reference |
| | | 2201/71638 | . . . Spectrum issues |
| 2201/00 | Indexing scheme relating to details of transmission systems not covered by a single group of H04B 3/00 - H04B 13/00 | 2203/00 | Indexing scheme relating to line transmission systems |
| 2201/69 | . Orthogonal indexing scheme relating to spread spectrum techniques in general | 2203/54 | . Aspects of powerline communications not already covered by H04B 3/54 and its subgroups |
| 2201/692 | . . Cognitive radio | 2203/5404 | . . Methods of transmitting or receiving signals via power distribution lines |
| 2201/694 | . . WPAN | 2203/5408 | . . . using protocols |
| 2201/696 | . . relating to Dowlink | 2203/5412 | . . . by modifying wave form of the power source |
| 2201/698 | . . relating to Uplink | 2203/5416 | . . . by adding signals to the wave form of the power source |
| 2201/707 | . . relating to direct sequence modulation | 2203/542 | . . . using zero crossing information |
| 2201/70701 | . . . featuring pilot assisted reception | 2203/5425 | . . . improving S/N by matching impedance, noise reduction, gain control |
| 2201/70702 | . . . Intercell-related aspects | 2203/5429 | . . Applications for powerline communications |
| 2201/70703 | . . . using multiple or variable rates | 2203/5433 | . . . Remote metering |
| 2201/70705 | Rate detection | 2203/5437 | . . . Wired telephone |
| 2201/70706 | . . . with means for reducing the peak-to-average power ratio | 2203/5441 | . . . Wireless systems or telephone |
| 2201/70707 | . . . Efficiency-related aspects | 2203/5445 | . . . Local network |
| 2201/70709 | with discontinuous detection | 2203/545 | . . . Audio/video application, e.g. interphone |
| 2201/7071 | with dynamic control of receiver resources | 2203/5454 | . . . Adapter and plugs |
| 2201/70711 | with modular structure | 2203/5458 | . . . Monitor sensor; Alarm systems |
| 2201/70713 | Reducing computational requirements | 2203/5462 | . . Systems for power line communications |
| 2201/70714 | Reducing hardware requirements | 2203/5466 | . . . using three phases conductors |
| 2201/70715 | . . . with application-specific features | 2203/547 | . . . via DC power distribution |
| 2201/70716 | . . . Quadrature | 2203/5475 | . . . adapted for drill or well combined with data transmission |
| 2201/70718 | . . . Particular systems or standards | 2203/5479 | . . . using repeaters |
| 2201/70719 | CDMA2000 | 2203/5483 | . . . using coupling circuits |
| 2201/7072 | HDR | 2203/5487 | cables |
| 2201/70722 | HSDPA/HSUPA | 2203/5491 | . . . using filtering and bypassing |
| 2201/70723 | Multi-carrier HSPA | 2203/5495 | . . . having measurements and testing channel |
| 2201/70724 | UMTS | | |
| 2201/70726 | Asynchronous CDMA | 2210/00 | Indexing scheme relating to optical transmission systems |
| 2201/70727 | . . . using fast Fourier transform | 2210/003 | . Devices including multiple stages, e.g., multi-stage optical amplifiers or dispersion compensators |
| 2201/70728 | . . . Frequency aspects | 2210/006 | . Devices for generating or processing an RF signal by optical means |
| 2201/7073 | . . . Direct sequence modulation synchronisation | | |
| 2201/70733 | 2D search | | |
| 2201/70736 | DSA | | |
| 2201/7097 | . . . Direct sequence modulation interference | | |
| 2201/709709 | Methods of preventing interference | | |
| 2201/709718 | Determine interference | | |
| 2201/709727 | GRAKE type RAKE receivers | | |
| 2201/709736 | Hybrid interference mitigation schemes | | |

- 2210/07 . Monitoring an optical transmission system using a supervisory signal ([OAM for WDM transmission H04J 14/0272](#))
- 2210/071 . . using alarms
- 2210/072 . . using an overhead signal
- 2210/074 . . using a superposed, over-modulated signal
- 2210/075 . . using a pilot tone
- 2210/077 . . using a separate fibre
- 2210/078 . . using a separate wavelength
- 2210/08 . Shut-down or eye-safety
- 2210/25 . Distortion or dispersion compensation
- 2210/252 . . after the transmission line, i.e. post-compensation
- 2210/254 . . before the transmission line, i.e. pre-compensation
- 2210/256 . . at the repeater, i.e. repeater compensation
- 2210/258 . . treating each wavelength or wavelength band separately
- 2210/516 . Optical conversion of optical modulation formats, e.g., from optical ASK to optical PSK
- 2210/517 . Optical NRZ to RZ conversion, or vice versa
- 2215/00 Reducing interference at the transmission system level**
- 2215/061 . Reduction of burst noise, e.g. in TDMA systems
- 2215/062 . . by inhibiting burst transmission
- 2215/063 . . by smoothing the transmission power envelope
- 2215/064 . Reduction of clock or synthesizer reference frequency harmonics
- 2215/065 . . by changing the frequency of clock or reference frequency
- 2215/066 . . by stopping a clock generator
- 2215/067 . . by modulation dispersion
- 2215/068 . . by avoiding a reception frequency range
- 2215/069 . Reduction of switch mode power supply ripple