CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY
(NOTE omitted)

H04 ELECTRIC COMMUNICATION TECHNIQUE
(NOTE omitted)

H04B TRANSMISSION

NOTE

This subclass <u>covers</u> 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.

1/00 **Details of transmission systems, not covered by a single one of groups <u>H04B 3/00</u> - <u>H04B 13/00</u>; Details of transmission systems not characterised by the medium used for transmission**

NOTE

In this group, group <u>H04B 1/0003</u> takes precedence over groups <u>H04B 1/005</u> - <u>H04B 1/76</u>

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 <u>H04L 25/00</u>; digital modulation/demodulation <u>H04L 27/00</u>; CDMA <u>H04B 1/707</u>; TDMA <u>H04B 7/2643</u>; image transmission <u>H04N 5/00</u>)}

1/0007 . . {wherein the AD/DA conversion occurs at radiofrequency or intermediate frequency stage}

1/001 . . . {Channel filtering, i.e. selecting a frequency channel within the SDR system (multiplexing of multicarrier modulation signals being represented by different frequencies <u>H04L 5/06</u>; multiplexing of multicarrier modulation signals <u>H04L 5/023</u>)}

1/0014 . . . {using DSP [Digital Signal Processor] quadrature modulation and demodulation}

1/0017 . . . {Digital filtering (<u>H04B 1/001</u> takes precedence; digital filters <u>per se</u> <u>H03H 17/00</u>)}

1/0021 . . . {Decimation, i.e. data rate reduction techniques (<u>H04B 1/0025</u> takes precedence)}

1/0025 . . . {using a sampling rate lower than twice the highest frequency component of the sampled signal (for demodulation of angle-modulated signals <u>H03D 3/006</u>)}

1/0028 . . {wherein the AD/DA conversion occurs at baseband stage}

1/0032 . . . {with analogue quadrature frequency conversion to and from the baseband (quadrature modulators and demodulators <u>per se</u> <u>H03D 3/007</u>, <u>H03C 3/40</u>)}

1/0035 . . . {Channel filtering, i.e. selecting a frequency channel within a software radio system (multiplexing of multicarrier modulation signals being represented by different frequencies <u>H04L 5/06</u>; multiplexing of multicarrier modulation signals <u>H04L 5/023</u>)}

1/0039 . . . {using DSP [Digital Signal Processor] quadrature modulation and demodulation}

1/0042 . . . {Digital filtering (<u>H04B 1/0035</u> takes precedence; digital filters <u>per se</u> <u>H03H 17/00</u>)}

1/0046 . . . {Decimation, i.e. data rate reduction techniques}

1/005 . {adapting radio receivers, transmitters andtransceivers for operation on two or more bands, i.e. frequency ranges}

1/0053 . . {with common antenna for more than one band}

1/0057 . . . {using diplexing or multiplexing filters for selecting the desired band}

1/006 . . . {using switches for selecting the desired band (<u>H04B 1/0057</u> takes precedence)}

1/0064 . . {with separate antennas for the more than one band (<u>H04B 1/0053</u> takes precedence)}

1/0067 . . {with one or more circuit blocks in common for different bands}

1/0071 . . . {using a common intermediate frequency for more than one band (<u>H04B 1/0075</u> takes precedence)}

1/0075 . . . {using different intermediate frequencied for the different bands}

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 that 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}

1/02	.	Transmitters
1/03	. .	Constructional details, e.g. casings, housings
1/034	. . .	Portable transmitters
1/0343	. . . .	{to be carried on the body}
1/0346	. . . .	{Hand-held transmitters}
1/036	. . .	Cooling arrangements
1/04	. .	Circuits
2001/0408	. . .	{with power amplifiers}
2001/0416	. . .	{having gain or transmission power control}
2001/0425	. . .	{with linearisation using predistortion}
2001/0433	. . .	{with linearisation using feedback}
2001/0441	. . .	{with linearisation using feed-forward}
2001/045	. . .	{with means for improving efficiency}
1/0458	. . .	{Arrangements for matching and coupling between power amplifier and antenna or between amplifying stages (matching circuits in general H03H)}
1/0466	. . .	{Fault detection or indication (H04B 1/0483 takes precedence)}
1/0475	. . .	{with means for limiting noise, interference or distortion (H04B 1/0483 takes precedence)}
1/0483	. . .	{Transmitters with multiple parallel paths}
2001/0491	. . .	{with frequency synthesizers, frequency converters or modulators}
1/06	.	Receivers
1/08	. .	Constructional details, e.g. cabinet
1/082	. . .	{to be used in vehicles (H04B 1/086 takes precedence; holding or mounting accessories B60R 11/02)}
2001/084	. . . .	{with removable front panel}
1/086	. . .	{Portable receivers}
1/088	. . . .	{with parts of the receiver detachable or collapsible}
1/10	. .	Means associated with receiver for limiting or suppressing noise or interference
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)}
1/1018	. . .	{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

1/123	. . .	{using adaptive balancing or compensation means (adaptive filter circuits and algorithms H03H)}
1/126	. . . .	{having multiple inputs, e.g. auxiliary antenna for receiving interfering signal (aerials in general H01Q)}
1/14	. . .	Automatic detuning arrangements
1/16	. .	Circuits
1/1607	. . .	{Supply circuits (converters H02M; filters therefor H02M 1/14; voltage stabilisers G05F 1/46)}
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)}
1/1623	. . . .	{using tubes}
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)}
1/1638	. . .	{Special circuits to enhance selectivity of receivers not otherwise provided for (resonant circuits H03H)}
1/1646	. . .	{adapted for the reception of stereophonic signals}
1/1653	. . . .	{Detection of the presence of stereo signals and pilot signal regeneration}
1/1661	. . . .	{Reduction of noise by manipulation of the baseband composite stereophonic signal or the decoded left and right channels}
1/1669	. . . . .	{of the demodulated composite stereo signal}
1/1676	. . . . . .	{of the sum or difference signal}
1/1684	. . . . . .	{of the decoded left or right stereo channel}
1/1692	. . . .	{using companding of the stereo difference signal, e.g. FMX (volume compression or expansion in amplifiers H03G 7/00)}
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)
1/20	. . .	for coupling gramophone pick-up, recorder output, or microphone to receiver
1/202	. . . .	{by remote control}
1/205	. . . .	{with control bus for exchanging commands between units}
1/207	. . . .	{with an audio or audio/video bus for signal distribution (H04B 1/205 takes precedence)}
1/22	. . .	for receivers in which no local oscillation is generated
1/24	. . . .	the receiver comprising at least one semiconductor device having three or more electrodes
1/26	. . .	for superheterodyne receivers (multiple frequency-changing H03D 7/16)
1/28	. . . .	the receiver comprising at least one semiconductor device having three or more electrodes
1/30	. . .	for homodyne or synchrodyne receivers (demodulator circuits H03D 1/22)

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}

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 fileters, 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}

5/72	**.** **.**	for local intradevice communication

> **WARNING**
>
> Group H04B 5/72 is impacted by reclassification into groups H04B 5/20, H04B 5/22, H04B 5/24, H04B 5/26, H04B 5/263, H04B 5/266, H04B 5/28, H04B 5/45 and H04B 5/70.
>
> All groups listed in this Warning should be considered in order to perform a complete search.

5/73	**.** **.**	for taking measurements, e.g. using sensing coils
5/75	**.** **.**	for isolation purposes
5/77	**.** **.**	for interrogation
5/79	**.** **.**	for data transfer in combination with power transfer
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

> **WARNING**
>
> Group H04B 7/04 is impacted by reclassification into groups H04B 7/04013 and H04B 7/04026.
>
> Groups H04B 7/04, H04B 7/04013 and H04B 7/04026 should be considered in order to perform a complete search.

7/04013	**.** **.** **.**	{Intelligent reflective surfaces}

> **WARNING**
>
> Groups H04B 7/04013 and H04B 7/04026 are incomplete pending reclassification of documents from group H04B 7/04.
>
> Groups H04B 7/04, H04B 7/04013 and H04B 7/04026 should be considered in order to perform a complete search.

7/04026	**.** **.** **.** **.**	{with codebook-based beamforming}
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
7/0456	**.** **.** **.**	Selection of precoding matrices or codebooks, e.g. using matrices antenna weighting
7/046	**.** **.** **.** **.** **.**	{taking physical layer constraints into account}
7/0465	**.** **.** **.** **.** **.** **.**	{taking power constraints at power amplifier or emission constraints, e.g. constant modulus, into account}
7/0469	**.** **.** **.** **.** **.** **.**	{taking special antenna structures, e.g. cross polarized antennas into account}
7/0473	**.** **.** **.** **.** **.** **.**	{taking constraints in layer or codeword to antenna mapping into account}
7/0478	**.** **.** **.** **.** **.**	{Special codebook structures directed to feedback optimisation}

> **WARNING**
>
> Group H04B 7/0478 is impacted by reclassification into groups H04B 7/0479, H04B 7/048 and H04B 7/0481.
>
> All groups listed in this Warning should be considered in order to perform a complete search.

7/0479	**.** **.** **.** **.** **.** **.**	{for multi-dimensional arrays, e.g. horizontal or vertical pre-distortion matrix index [PMI]}

> **WARNING**
>
> Group H04B 7/0479 is incomplete pending reclassification of documents from group H04B 7/0478.
>
> Groups H04B 7/0478 and H04B 7/0479 should be considered in order to perform a complete search.

7/048	**.** **.** **.** **.** **.** **.**	{using three or more PMIs}

> **WARNING**
>
> Group H04B 7/048 is incomplete pending reclassification of documents from group H04B 7/0478.
>
> Groups H04B 7/0478 and H04B 7/048 should be considered in order to perform a complete search.

7/0481	**.** **.** **.** **.** **.** **.**	{using subset selection of codebooks}

> **WARNING**
>
> Group H04B 7/0481 is incomplete pending reclassification of documents from group H04B 7/0478.
>
> Groups H04B 7/0478 and H04B 7/0481 should be considered in order to perform a complete search.

7/0482	**.** **.** **.** **.** **.**	{Adaptive codebooks}

7/0486	. . . . .	{taking channel rank into account}

WARNING

> Group H04B 7/0486 is impacted by reclassification into group H04B 7/0487.
>
> Groups H04B 7/0486 and H04B 7/0487 should be considered in order to perform a complete search.

7/0487	. . . . . .	{Codebooks having a nested structure}

WARNING

> Group H04B 7/0487 is incomplete pending reclassification of documents from group H04B 7/0486.
>
> Groups H04B 7/0486 and H04B 7/0487 should be considered in order to perform a complete search.

7/0491	. . .	using two or more sectors, i.e. sector diversity
7/0495	. . .	using overlapping sectors in the same base station to implement MIMO for antennas
7/06	. . .	at the transmitting station
7/0602	. . . .	{using antenna switching (H04B 7/0686 takes precedence; antenna beam directivity switching H01Q 3/24)}
7/0604	. . . . .	{with predefined switching scheme}
7/0606	. . . . .	{Random or pseudo-random switching scheme}
7/0608	. . . . .	{Antenna selection according to transmission parameters}
7/061	. . . . . .	{using feedback from receiving side}
7/0613	. . . .	{using simultaneous transmission (H04B 7/0686 takes precedence)}
7/0615	. . . . .	{of weighted versions of same signal}
7/0617	. . . . . .	{for beam forming}
7/0619	. . . . . .	{using feedback from receiving side (feedback signaling for adaptive modulation/coding H04L 1/0001)}
7/0621	. . . .	{Feedback content}
7/0623	. . . .	{Auxiliary parameters, e.g. power control [PCB] or not acknowledged commands [NACK], used as feedback information}
7/0626	. . . .	{Channel coefficients, e.g. channel state information [CSI]}
7/0628	. . . .	{Diversity capabilities}
7/063	. . . .	{Parameters other than those covered in groups H04B 7/0623 - H04B 7/0634, e.g. channel matrix rank or transmit mode selection}
7/0632	. . . .	{Channel quality parameters, e.g. channel quality indicator [CQI]}
7/0634	. . . .	{Antenna weights or vector/matrix coefficients}
7/0636	. . . .	{Feedback format}
7/0639	. . . .	{Using selective indices, e.g. of a codebook, e.g. pre-distortion matrix index [PMI] or for beam selection}
7/0641	. . . .	{Differential feedback}
7/0643	. . . .	{Feedback on request}
7/0645	. . . .	{Variable feedback}
7/0647	. . . .	{Variable feedback rate}
7/065	. . . .	{Variable contents, e.g. long-term or short-short}
7/0652	. . . . . .	{Feedback error handling}
7/0654	. . . .	{at the receiver, e.g. antenna verification at mobile station}
7/0656	. . . .	{at the transmitter, e.g. error detection at base station}
7/0658	. . . . . .	{Feedback reduction}
7/066	. . . .	{Combined feedback for a number of channels, e.g. over several subcarriers like in orthogonal frequency division multiplexing [OFDM]}
7/0663	. . . .	{using vector or matrix manipulations}
7/0665	. . . . .	{Feed forward of transmit weights to the receiver}
7/0667	. . . . .	{of delayed versions of same signal (using space-time coding H04L 1/0618)}
7/0669	. . . . . .	{using different channel coding between antennas (space-time coding H04L 1/0618)}
7/0671	. . . . . .	{using different delays between antennas}
7/0673	. . . . . .	{using feedback from receiving side}
7/0676	. . . . . .	{using random or pseudo-random delays}
7/0678	. . . . .	{using different spreading codes between antennas (code allocation H04J 13/16)}
7/068	. . . . .	{using space frequency diversity (space-frequency coding H04L 1/0606)}
7/0682	. . . . .	{using phase diversity (e.g. phase sweeping)}
7/0684	. . . . .	{using different training sequences per antenna}
7/0686	. . . .	{Hybrid systems, i.e. switching and simultaneous transmission}
7/0689	. . . . .	{using different transmission schemes, at least one of them being a diversity transmission scheme}
7/0691	. . . . .	{using subgroups of transmit antennas}
7/0693	. . . . . .	{switching off a diversity branch, e.g. to save power}
7/0695	. . . . .	{using beam selection}

WARNING

> Group H04B 7/0695 is impacted by reclassification into groups H04B 7/06952, H04B 7/06954, H04B 7/06956, H04B 7/06958, H04B 7/0696, H04B 7/06962, H04B 7/06964, H04B 7/06966 and H04B 7/06968.
>
> All groups listed in this Warning should be considered in order to perform a complete search.

7/06952 . . . . . . {Selecting one or more beams from a plurality of beams, e.g. beam training, management or sweeping}

WARNING

Groups H04B 7/06952, H04B 7/06954, H04B 7/06956, H04B 7/06958, H04B 7/0696, H04B 7/06962, H04B 7/06964, H04B 7/06966 and H04B 7/06968 are incomplete pending reclassification of documents from group H04B 7/0695.

All groups listed in this Warning should be considered in order to perform a complete search.

7/06954 . . . . {Sidelink beam training with support from third instance, e.g. the third instance being a base station}

7/06956 . . . . {using a selection of antenna panels}

7/06958 . . . . {Multistage beam selection, e.g. beam refinement}

7/0696 . . . . {Determining beam pairs}

7/06962 . . . . {Simultaneous selection of transmit [Tx] and receive [Rx] beams at both sides of a link}

7/06964 . . . . {Re-selection of one or more beams after beam failure}

7/06966 . . . . {using beam correspondence; using channel reciprocity, e.g. downlink beam training based on uplink sounding reference signal [SRS]}

7/06968 . . . . {using quasi-colocation [QCL] between signals}

7/0697 . . . . {using spatial multiplexing}

7/08 . . . at the receiving station

7/0802 . . . . {using antenna selection (H04B 7/0868 takes precedence; antenna beam directivity switching H01Q 3/24)}

7/0805 . . . . . {with single receiver and antenna switching (H04B 7/0822 takes precedence)}

7/0808 . . . . . . {comparing all antennas before reception}

7/0811 . . . . {during preamble or gap period}

7/0814 . . . . . . {based on current reception conditions, e.g. switching to different antenna when signal level is below threshold}

7/0817 . . . . . {with multiple receivers and antenna path selection}

7/082 . . . . . . {selecting best antenna path}

7/0822 . . . . . {according to predefined selection scheme}

7/0825 . . . . . {with main and with auxiliary or diversity antennas}

7/0828 . . . . . {with delay elements in antenna paths}

7/0831 . . . . . {Compensation of the diversity switching process for non-uniform properties or faulty operations of the switches used in the diversity switching process}

7/0834 . . . . . {based on external parameters, e.g. subscriber speed or location}

7/0837 . . . . {using pre-detection combining (H04B 7/0868 takes precedence)}

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)}

7/0842 . . . . . {Weighted combining}

7/0845 . . . . . . {per branch equalization, e.g. by an FIR-filter or RAKE receiver per antenna branch (rake receivers as such H04B 1/7115)}

7/0848 . . . . . . {Joint weighting}

7/0851 . . . . {using training sequences or error signal (minimizing error signal H04B 7/0854)}

7/0854 . . . . {using error minimizing algorithms, e.g. minimum mean squared error [MMSE], "cross-correlation" or matrix inversion}

7/0857 . . . . {using maximum ratio combining techniques, e.g. signal-to- interference ratio [SIR], received signal strenght indication [RSS]}

7/086 . . . . . . {using weights depending on external parameters, e.g. direction of arrival [DOA], predetermined weights or beamforming}

7/0862 . . . . . . {receiver computing weights based on information from the transmitter}

7/0865 . . . . . . {Independent weighting, i.e. weights based on own antenna reception parameters}

7/0868 . . . . {Hybrid systems, i.e. switching and combining}

7/0871 . . . . {using different reception schemes, at least one of them being a diversity reception scheme}

7/0874 . . . . {using subgroups of receive antennas}

7/0877 . . . . . {switching off a diversity branch, e.g. to save power}

7/088 . . . . . {using beam selection}

7/0882 . . . {using post-detection diversity}

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)

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)}

7/15514 . . . . . {for shadowing compensation (for satellite mobile telephony service systems H04B 7/18536)}

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)}

7/15528 . . . . {Control of operation parameters of a relay station to exploit the physical medium}

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)}

7/15542 . . . . . {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)}

7/1555 . . . . . {Selecting relay station antenna mode, e.g. selecting omnidirectional -, directional beams, selecting polarizations}

7/15557 . . . . {Selecting relay station operation mode, e.g. between amplify and forward mode, decode and forward mode or FDD - and TDD mode}

7/15564 . . . . {Relay station antennae loop interference reduction}

7/15571 . . . . . {by signal isolation, e.g. isolation by frequency or by antenna pattern, or by polarization}

7/15578 . . . . . {by gain adjustment}

7/15585 . . . . . {by interference cancellation}

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)}

7/165 . . . . employing angle modulation

7/17 . . . . employing pulse modulation, e.g. pulse code modulation

7/185 . . . Space-based or airborne stations; {Stations for satellite systems}(H04B 7/204 takes precedence)

7/18502 . . . . {Airborne stations}

7/18504 . . . . . {Aircraft used as relay or high altitude atmospheric platform}

7/18506 . . . . . {Communications with or from aircraft, i.e. aeronautical mobile service}

7/18508 . . . . . . {with satellite system used as relay, i.e. aeronautical mobile satellite service}

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)}

7/18513 . . . . . {Transmission in a satellite or space-based system}

7/18515 . . . . . {Transmission equipment in satellites or space-based relays}

7/18517 . . . . . {Transmission equipment in earth stations}

7/18519 . . . . . {Operations control, administration or maintenance}

7/18521 . . . . {Systems of inter linked satellites, i.e. inter satellite service (for optical links between satellites H04B 10/118)}

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)}

7/18526 . . . . . {Arrangements for data linking, networking or transporting, or for controlling an end to end session (data switching networks H04L 12/00)}

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}

7/1853 . . . . {Satellite systems for providing telephony service to a mobile station, i.e. mobile satellite service (for selecting H04W)}

7/18532 . . . . . {Arrangements for managing transmission, i.e. for transporting data or a signalling message}

7/18534 . . . . . . {for enhancing link reliablility, e.g. satellites diversity}

7/18536 . . . . . . {Shadowing compensation therefor, e.g. by using an additional terrestrial relay}

7/18539 . . . . . {Arrangements for managing radio, resources, i.e. for establishing or releasing a connection}

7/18541 . . . . . . {for handover of resources}

7/18543 . . . . . . {for adaptation of transmission parameters, e.g. power control (for detecting or preventing errors in the information received H04L 1/00)}

7/18545 . . . . . {Arrangements for managing station mobility, i.e. for station registration or localisation}

7/18547 . . . . . . {for geolocalisation of a station (position fixing by direction or distance determination G01S 5/00)}

7/1855 . . . . {using a telephonic control signal, e.g. propagation delay variation, Doppler frequency variation, power variation, beam identification}

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)}

7/18554 . . . . {using the position provided by an existing geolocalisation system}

7/18556 . . . . . . {using a location database}

7/18558 . . . . . {Arrangements for managing communications, i.e. for setting up, maintaining or releasing a call between stations}

7/1856	. . . . . .	{for call routing}
7/18563	. . . . .	{Arrangements for interconnecting multiple systems (data switching networks H04L 12/00)}
7/18565	. . . . .	{Arrangements for preventing unauthorised access or for providing user protection (arrangements for secret or secure communication H04L 9/00)}
7/18567	. . . . .	{Arrangements for providing additional services to the basic mobile satellite telephony service}
7/18569	. . . . .	{Arrangements for system physical machines management, i.e. for construction operations control, administration, maintenance}
7/18571	. . . . . .	{for satellites; for fixed or mobile stations}
7/18573	. . . . . .	{for operations control, administration or maintenance}
7/18576	. . . .	{Satellite systems for providing narrowband data service to fixed or mobile stations, e.g. using a minisatellite, a microsatellite (for selecting H04W)}
7/18578	. . . .	{Satellite systems for providing broadband data service to individual earth stations (for selecting H04W; provisions for broadband connection, H04Q 11/0478)}
7/1858	. . . . .	{Arrangements for data transmission on the physical system, i.e. for data bit transmission between network components}
7/18582	. . . . .	{Arrangements for data linking, i.e. for data framing, for error recovery, for multiple access}
7/18584	. . . . .	{Arrangements for data networking, i.e. for data packet routing, for congestion control (data switching networks H04L 12/00)}
7/18586	. . . . .	{Arrangements for data transporting, e.g. for an end to end data transport or check}
7/18589	. . . . .	{Arrangements for controlling an end to end session, i.e. for initialising, synchronising or terminating an end to end link}
7/18591	. . . . .	{Arrangements for interconnecting multiple systems (data switching networks H04L 12/00)}
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}
7/18597	. . . . .	{Arrangements for system physical machines management, i.e. for construction, operations control, administration, maintenance}
7/19	. . . .	Earth-synchronous stations
7/195	. . . .	Non-synchronous stations
7/204	. . .	Multiple access
7/2041	. . . .	{Spot beam multiple access}
7/2043	. . . .	{Mixed mode, TDM and FDM systems}
7/2045	. . . .	{SS-FDMA, FDMA satellite switching}
7/2046	. . . .	{SS-TDMA, TDMA satellite switching}

7/2048	. . . . .	{Frame structure, synchronisation or frame acquisition in SS-TDMA systems}
7/208	. . . .	Frequency-division multiple access {[FDMA]}
7/212	. . . .	Time-division multiple access {[TDMA]}
7/2121	. . . . .	{Channels assignment to the different stations}
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}
7/2662	. . .	{Arrangements for Wireless System Synchronisation}
7/2665	. . . .	{Arrangements for Wireless Frequency Division Multiple Access [FDMA] System Synchronisation}
7/2668	. . . .	{Arrangements for Wireless Code-Division Multiple Access [CDMA] System Synchronisation, (for code acquisition H04B 1/7075, for code tracking H04B 1/7085)}

7/2671	. . . . {Arrangements for Wireless Time-Division Multiple Access [TDMA] System Synchronisation}
7/2675	. . . . . {Frequency synchronisation}
7/2678	. . . . . {Time synchronisation}
7/2681	. . . . . . {Synchronisation of a mobile station with one base station}
7/2684	. . . . . . {Synchronisation of a mobile station with more than one base station}
7/2687	. . . . . . {Inter base stations synchronisation}
7/269	. . . . {Master/slave synchronisation}
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}
7/2696	. . . . {Over the air autonomous synchronisation, e.g. by monitoring network activity (H04B 7/2693 takes precedence)}

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 [OTDR]
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}

10/616	. . .	{Details of the electronic signal processing in coherent optical receivers}
10/6161	. . . .	{Compensation of chromatic dispersion}
10/6162	. . . .	{Compensation of polarization related effects, e.g., PMD, PDL}
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]}
10/6164	. . . .	{Estimation or correction of the frequency offset between the received optical signal and the optical local oscillator}
10/6165	. . . .	{Estimation of the phase of the received optical signal, phase error estimation or phase error correction}
10/6166	. . . .	{Polarisation demultiplexing, tracking or alignment of orthogonal polarisation components}
10/63	. . .	Homodyne {, i.e. coherent receivers where the local oscillator is locked in frequency and phase to the carrier signal}
10/64	. . .	Heterodyne {, i.e. coherent receivers where, after the opto-electronic conversion, an electrical signal at an intermediate frequency [IF] is obtained}
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}
10/66	. .	Non-coherent receivers, e.g. using direct detection
10/67	. . .	Optical arrangements in the receiver
10/671	. . . .	{for controlling the input optical signal}
10/672	. . . . .	{for controlling the power of the input optical signal}
10/673	. . . . . .	{using an optical preamplifier}
10/674	. . . . . .	{using a variable optical attenuator}
10/675	. . . . .	{for controlling the optical bandwidth of the input signal, e.g. spectral filtering}
10/676	. . . . .	{for all-optical demodulation of the input optical signal}
10/677	. . . . .	{for differentially modulated signal, e.g. DPSK signals}
10/69	. . .	Electrical arrangements in the receiver
10/691	. . . .	{Arrangements for optimizing the photodetector in the receiver}
10/6911	. . . . .	{Photodiode bias control, e.g. for compensating temperature variations}
10/693	. . . .	{Arrangements for optimizing the preamplifier in the receiver}
10/6931	. . . . .	{Automatic gain control of the preamplifier}
10/6932	. . . . .	{Bandwidth control of bit rate adaptation}
10/6933	. . . . .	{Offset control of the differential preamplifier}
10/695	. . . .	{Arrangements for optimizing the decision element in the receiver, e.g. by using automatic threshold control}
10/697	. . . .	{Arrangements for reducing noise and distortion}
10/6971	. . . . .	{using equalisation}
10/6972	. . . . .	{using passive filtering}
10/6973	. . . . .	{using noise matching networks}
10/70	.	Photonic quantum communication

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
10/801	. .	{using optical interconnects, e.g. light coupled isolators, circuit board interconnections}
10/802	. . .	{for isolation, e.g. using optocouplers}
10/803	. . .	{Free space interconnects, e.g. between circuit boards or chips}
10/806	. .	{Arrangements for feeding power}
10/807	. . .	{Optical power feeding, i.e. transmitting power using an optical signal}
10/808	. . .	{Electrical power feeding of an optical transmission system}
10/85	. .	Protection from unauthorised access, e.g. eavesdrop protection
10/90	.	Non-optical transmission systems, e.g. transmission systems employing non-photonic corpuscular radiation

11/00		**Transmission systems employing sonic, ultrasonic or infrasonic waves**
13/00		**Transmission systems characterised by the medium used for transmission, not provided for in groups H04B 3/00 - H04B 11/00**
13/005	.	{Transmission systems in which the medium consists of the human body}
13/02	.	Transmission systems in which the medium consists of the earth or a large mass of water thereon, e.g. earth telegraphy
14/00		**Transmission systems not characterised by the medium used for transmission** (details thereof H04B 1/00)
14/002	.	{characterised by the use of a carrier modulation (using subcarrier modulation H04B 14/08)}
14/004	. .	{Amplitude modulation}
14/006	. .	{Angle modulation}
14/008	. .	{Polarisation modulation}
14/02	.	characterised by the use of pulse modulation (in radio transmission relays H04B 7/17)
14/023	. .	{using pulse amplitude modulation}
14/026	. .	{using pulse time characteristics modulation, e.g. width, position, interval}
14/04	. .	using pulse code modulation
14/042	. . .	{Special circuits, e.g. comparators}
14/044	. . .	{Sample and hold circuits (in general G11C 27/02)}
14/046	. . .	{Systems or methods for reducing noise or bandwidth}
14/048	. . . .	{Non linear compression or expansion}
14/06	. .	using differential modulation, e.g. delta modulation
14/062	. . .	{using delta modulation or one-bit differential modulation [1DPCM]}
14/064	. . . .	{with adaptive feedback}
14/066	. . .	{using differential modulation with several bits [NDPCM]}
14/068	. . . .	{with adaptive feedback}
14/08	.	characterised by the use of a sub-carrier
15/00		**Suppression or limitation of noise or interference** (by means associated with receiver H04B 1/10)
15/005	.	{Reducing noise, e.g. humm, from the supply}

15/02	.	Reducing interference from electric apparatus by means located at or near the interfering apparatus
15/025	. .	{Reducing interference from ignition apparatus of fuel engines (cables with high resistance H01B)}
15/04	. .	the interference being caused by substantially sinusoidal oscillations, e.g. in a receiver or in a tape-recorder
15/06	. . .	by local oscillators of receivers
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)
17/0082	.	{using service channels; using auxiliary channels}
17/0085	. .	{using test signal generators}
17/0087	. .	{using auxiliary channels or channel simulators}
17/10	.	of transmitters
17/101	. .	{for measurement of specific parameters of the transmitter or components thereof}
17/102	. . .	{Power radiated at antenna}
17/103	. . .	{Reflected power, e.g. return loss}
17/104	. . .	{of other parameters, e.g. DC offset, delay or propagation times}
17/11	. .	for calibration
17/12	. . .	of transmit antennas, e.g. of the amplitude or phase
17/13	. . .	of power amplifiers, e.g. gain or non-linearity
17/14	. . .	of the whole transmission and reception path, e.g. self-test loop-back
17/15	. .	Performance testing

> **WARNING**
>
> Group H04B 17/15 is impacted by reclassification into group H04B 17/191.
>
> Groups H04B 17/15 and H04B 17/191 should be considered in order to perform a complete search.

17/16	. . .	Test equipment located at the transmitter
17/17	. . .	Detection of non-compliance or faulty performance, e.g. response deviations (H04B 17/18 takes precedence)
17/18	. . .	Monitoring during normal operation
17/19	. . .	Self-testing arrangements
17/191	. . .	{Over-the-air testing}

> **WARNING**
>
> Group H04B 17/191 is incomplete pending reclassification of documents from group H04B 17/15.
>
> Groups H04B 17/15 and H04B 17/191 should be considered in order to perform a complete search.

17/20	.	of receivers

> **WARNING**
>
> Group H04B 17/20 is impacted by reclassification into groups H04B 17/201, H04B 17/202, H04B 17/203, H04B 17/204, H04B 17/22, H04B 17/221, H04B 17/25, H04B 17/252, H04B 17/253, H04B 17/254 and H04B 17/255.
>
> All groups listed in this Warning should be considered in order to perform a complete search.

17/201	. .	{for measurement of specific parameters of the receiver or components thereof}

> **WARNING**
>
> Groups H04B 17/201, H04B 17/202, H04B 17/203 and H04B 17/204 are incomplete pending reclassification of documents from group H04B 17/20.
>
> All groups listed in this Warning should be considered in order to perform a complete search.

17/202	. . .	{Power received at the antenna}
17/203	. . .	{Receiver sensitivity}
17/204	. . .	{of interfering signals, e.g. passive intermodulation}
17/21	. .	for calibration; for correcting measurements

> **WARNING**
>
> Group H04B 17/21 is impacted by reclassification into groups H04B 17/22 and H04B 17/221.
>
> Groups H04B 17/21, H04B 17/22 and H04B 17/221 should be considered in order to perform a complete search.

17/22	. . .	{for calibration of the receiver components}

> **WARNING**
>
> Groups H04B 17/22 and H04B 17/221 are incomplete pending reclassification of documents from groups H04B 17/20 and H04B 17/21.
>
> All groups listed in this Warning should be considered in order to perform a complete search.

17/221	. . . .	{of receiver antennas, e.g. as to amplitude or phase}
17/23	. .	Indication means, e.g. displays, alarms, audible means
17/24	. .	with feedback of measurements to the transmitter
17/25	. .	{taking multiple measurements}

> **WARNING**
>
> Groups H04B 17/25, H04B 17/252, H04B 17/253, H04B 17/254 and H04B 17/255 are incomplete pending reclassification of documents from group H04B 17/20.
>
> All groups listed in this Warning should be considered in order to perform a complete search.

17/252	. . .	{measuring signals from different transmission points or directions of arrival, e.g. in multi RAT or dual connectivity}
17/253	. . .	{measuring at different locations or reception points}
17/254	. . .	{measuring at different reception times}
17/255	. . .	{measuring at different states of transmission, e.g. active or idle; measuring at different measurement rates; measuring with different measurement schedules}
17/26	. .	using historical data, averaging values or statistics
17/27	. .	for locating or positioning the transmitter
17/29	. .	Performance testing

> **WARNING**
>
> Group H04B 17/29 is impacted by reclassification into groups H04B 17/294, H04B 17/295, H04B 17/296 and H04B 17/297.
>
> All groups listed in this Warning should be considered in order to perform a complete search.

17/294	. . .	{with test equipment located at the receiver}

> **WARNING**
>
> Group H04B 17/294 is incomplete pending reclassification of documents from group H04B 17/29.
>
> Groups H04B 17/29 and H04B 17/294 should be considered in order to perform a complete search.

17/295	. . .	{Detection of non-compliance or faulty performance, e.g. response deviations (monitoring during normal operations H04B 17/296)}

> **WARNING**
>
> Group H04B 17/295 is incomplete pending reclassification of documents from group H04B 17/29.
>
> Groups H04B 17/29 and H04B 17/295 should be considered in order to perform a complete search.

17/296	. . .	{Monitoring performance during normal operation}

> **WARNING**
>
> Group H04B 17/296 is incomplete pending reclassification of documents from group H04B 17/29.
>
> Groups H04B 17/29 and H04B 17/296 should be considered in order to perform a complete search.

17/297	. . .	{Self-testing arrangements}

> **WARNING**
>
> Group H04B 17/297 is incomplete pending reclassification of documents from group H04B 17/29.
>
> Groups H04B 17/29 and H04B 17/297 should be considered in order to perform a complete search.

17/30	.	of propagation channels
17/309	. .	Measuring or estimating channel quality parameters

> **WARNING**
>
> Group H04B 17/309 is impacted by reclassification into groups H04B 17/346 and H04B 17/347.
>
> Groups H04B 17/309, H04B 17/346 and H04B 17/347 should be considered in order to perform a complete search.

17/318	. . .	Received signal strength

> **WARNING**
>
> Group H04B 17/318 is impacted by reclassification into group H04B 17/328.
>
> Groups H04B 17/318 and H04B 17/328 should be considered in order to perform a complete search.

17/327	. . . .	Received signal code power [RSCP]
17/328	. . . .	{Reference signal received power [RSRP]; Reference signal received quality [RSRQ]}

> **WARNING**
>
> Group H04B 17/328 is incomplete pending reclassification of documents from group H04B 17/318.
>
> Groups H04B 17/318 and H04B 17/328 should be considered in order to perform a complete search.

17/336	. . .	Signal-to-interference ratio [SIR] or carrier-to-interference ratio [CIR]
17/345	. . .	Interference values ({signal-to-interference ratio [SIR] or carrier-to-interference ratio [CIR]} H04B 17/336)
17/346	. . .	{Noise values (signal-to-interference ratio [SIR] or carrier-to-interference ratio [CIR] H04B 17/336)}

> **WARNING**
>
> Group H04B 17/346 is incomplete pending reclassification of documents from group H04B 17/309.
>
> Groups H04B 17/309 and H04B 17/346 should be considered in order to perform a complete search.

17/347	. . .	{Path loss}

> **WARNING**
>
> Group H04B 17/347 is incomplete pending reclassification of documents from group H04B 17/309.
>
> Groups H04B 17/309 and H04B 17/347 should be considered in order to perform a complete search.

17/354	. . .	Adjacent channel leakage power
17/364	. . .	Delay profiles
17/373	. .	Predicting channel quality {or other radio frequency [RF]} parameters
17/382	. .	for resource allocation, admission control or handover
17/391	. .	Modelling the propagation channel

17/3911	. . .	{Fading models or fading generators}
17/3912	. . .	{Simulation models, e.g. distribution of spectral power density or received signal strength indicator [RSSI] for a given geographic region}
17/3913	. . .	{Predictive models, e.g. based on neural network models}
17/40	.	of relay systems
17/401	. .	{with selective localization}
17/402	. . .	{using different frequencies}
17/403	. . . .	{generated by local oscillators}
17/404	. . . .	{selected by local filters}
17/405	. . . .	{generated by local multipliers, dividers, modulators}
17/406	. . .	{using coded addresses}
17/407	. .	{without selective localization}
17/408	. . .	{using successive loop-backs}
17/409	. . .	{by means of resistance, voltage or current measurement}

2201/00		**Indexing scheme relating to details of transmission systems not covered by a single group of H04B 3/00 - H04B 13/00**
2201/69	.	Orthogonal indexing scheme relating to spread spectrum techniques in general
2201/692	. .	Cognitive radio
2201/694	. .	WPAN
2201/696	. .	relating to Dowlink
2201/698	. .	relating to Uplink
2201/707	. .	relating to direct sequence modulation
2201/70701	. . .	featuring pilot assisted reception
2201/70702	. . .	Intercell-related aspects
2201/70703	. . .	using multiple or variable rates
2201/70705	. . . .	Rate detection
2201/70706	. . .	with means for reducing the peak-to-average power ratio
2201/70707	. . .	Efficiency-related aspects
2201/70709	. . . .	with discontinuous detection
2201/7071	. . . .	with dynamic control of receiver resources
2201/70711	. . . . .	with modular structure
2201/70713	. . . .	Reducing computational requirements
2201/70714	. . . .	Reducing hardware requirements
2201/70715	. . .	with application-specific features
2201/70716	. . .	Quadrature
2201/70718	. . .	Particular systems or standards
2201/70719	. . . .	CDMA2000
2201/7072	. . . .	HDR
2201/70722	. . . .	HSDPA/HSUPA
2201/70723	. . . . .	Multi-carrier HSPA
2201/70724	. . . .	UMTS
2201/70726	. . . .	Asynchronous CDMA
2201/70727	. . .	using fast Fourier transform
2201/70728	. . .	Frequency aspects
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
2201/709745	. . . .	Iterative interference mitigation schemes

2201/709754	. . . .	Blind joint detection
2201/709763	. . . .	Joint detection using feedback
2201/709772	. . . .	Joint detection using feedforward
2201/709781	. . . .	Linear detectors for joint detection
2201/70979	. . . .	Fat finger issues in RAKE receivers
2201/713	. .	Frequency hopping
2201/71307	. . .	Partial band interference
2201/71315	. . .	Wide band interference
2201/71323	. . .	Adaptive systems
2201/7133	. . .	Asymmetric systems
2201/71338	. . .	Asynchronous systems
2201/71346	. . .	Bluetooth
2201/71353	. . .	Fast frequency hopping
2201/71361	. . .	Slow frequency hopping
2201/71369	. . .	OFCHM
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

2203/00		**Indexing scheme relating to line transmission systems**
2203/54	.	Aspects of powerline communications not already covered by H04B 3/54 and its subgroups
2203/5404	. .	Methods of transmitting or receiving signals via power distribution lines
2203/5408	. . .	using protocols
2203/5412	. . .	by modofying wave form of the power source
2203/5416	. . .	by adding signals to the wave form of the power source
2203/542	. . .	using zero crossing information
2203/5425	. . .	improving S/N by matching impedance, noise reduction, gain control
2203/5429	. .	Applications for powerline communications
2203/5433	. . .	Remote metering
2203/5437	. . .	Wired telephone
2203/5441	. . .	Wireless systems or telephone
2203/5445	. . .	Local network
2203/545	. .	Audio/video application, e.g. interphone
2203/5454	. .	Adapter and plugs
2203/5458	. .	Monitor sensor; Alarm systems
2203/5462	. .	Systems for power line communications
2203/5466	. . .	using three phases conductors
2203/547	. . .	via DC power distribution
2203/5475	. . .	adapted for drill or well combined with data transmission
2203/5479	. . .	using repeaters
2203/5483	. . .	using coupling circuits
2203/5487	. . . .	cables
2203/5491	. . .	using filtering and bypassing
2203/5495	. . .	having measurements and testing channel

2210/00		**Indexing scheme relating to optical transmission systems**
2210/003	.	Devices including multiple stages, e.g., multi-stage optical amplifiers or dispersion compensators
2210/006	.	Devices for generating or processing an RF signal by optical means

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