

CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H04 ELECTRIC COMMUNICATION TECHNIQUE

(NOTE omitted)

H04Q SELECTING (switches, relays, selectors [H01H](#); electronic switches [H03K 17/00](#))

NOTES

1. This subclass covers:
 - methods, circuits, or apparatus for establishing selectively a connection between a desired number of stations (normally two), or between a main station and a desired number of substations (normally one) for the purpose of transferring information via this connection after it has been established;
 - selective calling arrangements over connections already established.

In either case, the connection may be made by means of electric conductors or electromagnetic waves.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
 - "subscriber" is a general term for terminal equipment, e.g. telephone for public use;
 - "substation" means a subscriber or monitoring equipment which may connect a single subscriber to a line without choice as to subscriber;
 - "satellite" is a kind of exchange the operation of which depends upon control signals received from a supervisory exchange;
 - "switching centres" includes exchanges and satellites.

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 selecting apparatus or arrangements {for establishing connections among stations for the purpose of transferring information via these connections}	1/114	. . . {flooding protection, e.g. using water proof provision}
1/02	. Constructional details	1/116	. . . {lightning or EMI protection, e.g. shielding or grounding (suppression of noise or interference in transmission systems H04B 15/00)}
1/021	. . {using pivoting mechanisms for accessing the interior of the apparatus}	1/118	. . . {heat or sun protection}
1/023	. . {using sliding mechanisms for accessing the interior of the apparatus}	1/12	. . Arrangements of multiple bars with or without pivotable frames
1/025	. . {Cabinets}	1/13	. . {Patch panels for monitoring, interconnecting or testing circuits, e.g. patch bay, patch field or jack field; Patching modules}
1/026	. . . {characterized by door details}	1/131	. . . {being pivotable}
1/028	. . {Subscriber network interface devices (line interfacing in the subscriber set H04M 1/0293)}	1/133	. . . {being slidable}
1/03	. . {Power distribution arrangements}	1/135	. . . {characterized by patch cord details}
1/032	. . . {power failure protection}	1/136	. . . . {having patch field management or physical layer management arrangements}
1/035	. . {Cooling of active equipments, e.g. air ducts}	1/138	. . . . . {using RFID}
1/04	. . Frames or mounting racks for selector switches; Accessories therefor, e.g. frame cover	1/14	. . Distribution frames
1/06	. . Cable ducts or mountings specially adapted for exchange installations (in general H02G)	1/141	. . . {Details of connexions between cable and distribution frame}
1/062	. . . {vertical management arrangements}	1/142	. . . {Terminal blocks for distribution frames}
1/064	. . . {horizontal management arrangements}	1/143	. . . {with contacts on circular surface}
1/066	. . . {arranged on the front side}	1/144	. . . {Plugs used in distribution frames}
1/068	. . . {arranged on the rear side}	1/145	. . . {with switches arranged in a matrix configuration}
1/08	. . Frames or mounting racks for relays; Accessories therefor	1/146	. . . {with line protection means}
1/09	. . {Frames or mounting racks not otherwise provided for}	1/147	. . . {using robots for distributing}
1/10	. . Exchange station construction	1/148	. . . {Identification strips for distribution frames}
1/11	. . {Protection against environment}	1/149	. . . {Wireguides in connector blocks}
1/112	. . . {mechanical protection, e.g. resistance to earthquakes}	1/15	. . {Backplane arrangements}
		1/155	. . . {characterised by connection features}

- 1/16 . . Wiring arrangements for selector switches or relays in frames
- 1/18 . Electrical details
- 1/20 . . Testing circuits or apparatus; Circuits or apparatus for detecting, indicating, or signalling faults or troubles
- 1/22 . . . Automatic arrangements
- 1/24 for connection devices
- 1/245 {in time-division multiplex systems}
- 1/26 for signalling trouble in unoccupied sub-exchanges
- 1/28 . . Current-supply circuits or arrangements for selection equipment at exchanges
- 1/30 . . Signalling arrangements; Manipulation of signalling currents (multiplex systems providing for calling or supervisory signals [H04J 1/14](#), [H04Q 3/12](#); telephone substation equipment [H04M 1/00](#))
- 1/32 . . . using trains of dc pulses ([H04Q 1/39](#) takes precedence)
- 1/34 Impulse regenerators with mechanical or other non-electrical marking arrangements
- 1/36 Pulse-correcting arrangements, e.g. for reducing effects due to interference
- 1/38 . . . using combinations of direct currents of different amplitudes or polarities over line conductors or combination of line conductors
- 1/39 . . . using coded pulse groups
- 1/40 . . . whereby duration of pulse or interval between two pulses is variable
- 1/42 involving the position of a pulse in a cycle
- 1/44 . . . using alternate current ([H04Q 1/50](#) takes precedence)
- 1/442 with out-of-voice band signalling frequencies
- 1/4423 {using one signalling frequency}
- 1/4426 {using two or more signalling frequencies, transmitted in succession or simultaneously}
- 1/444 with voice-band signalling frequencies
- 1/446 using one signalling frequency ([H04Q 1/46](#) takes precedence)
- 1/4465 {the same frequency being used for all signalling information, e.g. A.C. nr.9 system}
- 1/448 with conversion of a single frequency signal into a digital signal
- 1/4485 {which is transmitted in digital form}
- 1/45 using multi-frequency signalling ([H04Q 1/46](#) takes precedence)
- 1/453 in which m-out-of-n signalling frequencies are transmitted
- 1/4535 {with an additional signal transmitted for voice protection}
- 1/457 with conversion of multifrequency signals into digital signals
- 1/4575 {which are transmitted in digital form}
- 1/46 comprising means for distinguishing between a signalling current of predetermined frequency and a complex current containing that frequency, e.g. speech current
- 1/48 . . . Induced-current signalling arrangements
- 1/50 . . . Conversion between different kinds of signals
- 1/54 . . Amplifier switched-on automatically in dependence on automatically-selected lines
- 1/56 . . Balancing circuitry switched-on automatically in dependence on automatically-selected lines
- 3/00** **Selecting arrangements ([H04Q 5/00](#) - [H04Q 11/00](#) take precedence)**
 - 3/0004 . {using crossbar selectors in the switching stages}
 - 3/0008 . {using relay selectors in the switching stages}
 - 3/0012 . . {in which the relays are arranged in a matrix configuration}
 - 3/0016 . {Arrangements providing connection between exchanges}
 - 3/002 . . {Details}
 - 3/0025 . . {Provisions for signalling (circuitry in [H04Q 1/30](#))}
 - 3/0029 . . {Provisions for intelligent networking}
 - 3/0033 . . . {customer-controlled}
 - 3/0037 . . . {involving call modelling techniques, e.g. modifications to the basic call state model [BCSM]}
 - 3/0041 . . . {involving techniques for avoiding interaction of call service features}
 - 3/0045 . . . {involving hybrid, i.e. a mixture of public and private, or multi-vendor systems}
 - 3/005 . . . {Personal communications services, e.g. provisions for portability of subscriber numbers (subscriber services provided at exchanges [H04M 3/42](#))}
 - 3/0054 . . . {Service creation techniques}
 - 3/0058 {using service-independent building blocks (SIBBs) or "primitives"}
 - 3/0062 . . {Provisions for network management}
 - 3/0066 . . . {Bandwidth allocation or management}
 - 3/007 . . . {customer-controlled}
 - 3/0075 . . . {Fault management techniques}
 - 3/0079 {involving restoration of networks, e.g. disaster recovery, self-healing networks}
 - 3/0083 . . . {Network planning or design; Modelling of planned or existing networks}
 - 3/0087 . . . {Network testing or monitoring arrangements}
 - 3/0091 . . . {Congestion or overload control}
 - 3/0095 . . . {Specification, development or application of network management software, e.g. software re-use}
- 3/02 . Circuit arrangements for selectors responsive to a permutation code
- 3/04 . Circuit arrangements for receivers of routing digits
- 3/06 . . for group or trunk group selectors
- 3/08 . . for local or long-distance selectors
- 3/10 . . for PBX selectors, i.e. private branch exchange selectors
- 3/12 . . for line selectors providing transfer of routing digits
- 3/14 . . for two-way operation selectors
- 3/16 . . for marking-switches
- 3/18 . Circuit arrangements for first stage of hunting switching
- 3/20 . . for preselectors
- 3/22 . . . comprising common calling and disconnecting circuit
- 3/24 . . for line finders
- 3/26 . . . comprising common calling and disconnecting circuit

- 3/28 . . . comprising main groups and subgroups
- 3/30 . . Selector finders, i.e. allotters
- 3/32 . Circuit arrangements for second or subsequent stages of hunting switching
- 3/34 . . for the second preselection stage
- 3/36 . . for the second line-finder stage
- 3/38 . . for stages after the group selector stage
- 3/40 . . for stages after the line selector, e.g. for extension selector
- 3/42 . Circuit arrangements for indirect selecting controlled by common circuits, e.g. register controller, marker
- 3/44 . . using revertive control
- 3/46 . . using signals other than revertive impulses
- 3/47 . . using translators
- 3/48 . . using markers
- 3/49 . . . for end-to-end marking
- 3/495 . . . for routing connecting paths
- 3/52 . . using static devices in switching stages, e.g. electronic switching arrangements
- 3/521 . . . {using semiconductors in the switching stages}
- 3/523 {Details}
- 3/525 . . . {using tubes in the switching stages}
- 3/526 . . . {Optical switching systems}
- 3/528 {Details}
- 3/54 . . in which the logic circuitry controlling the exchange is centralised
- 3/542 . . . {Logic circuits or arrangements therefor (logic circuits in general H03K 19/00)}
- 3/545 . . . using a stored programme
- 3/54508 {Configuration, initialization}
- 3/54516 {Initialization, software or data downloading (G06F 9/445 takes precedence)}
- 3/54525 {Features introduction}
- 3/54533 {Configuration data, translation, passwords, databases}
- 3/54541 {using multi-processor systems}
- 3/5455 {Multi-processor, parallelism, distributed systems}
- 3/54558 {Redundancy, stand-by}
- 3/54566 {Intelligent peripherals, adjunct processors}
- 3/54575 {Software application}
- 3/54583 {Software development, e.g. procedural, object oriented, software generation, software testing}
- 3/54591 {Supervision, e.g. fault localisation, traffic measurements, avoiding errors, failure recovery, monitoring, statistical analysis}
- 3/55 . . . using wired logic circuitry
- 3/552 {Wired circuits or arrangements therefor}
- 3/555 being comprised by electro-magnetic devices
- 3/56 . . in which the control signals are multiplexed
- 3/58 . Arrangements providing connection between main exchange and sub-exchange or satellite
- 3/60 . . for connecting to satellites or concentrators which connect one or more exchange lines with a group of local lines
- 3/602 . . . {Circuit arrangements therefor}
- 3/605 . . . {Arrangements in the satellite or concentrator}
- 3/607 {Details}
- 3/62 . . for connecting to private branch exchanges
- 3/622 {Circuit arrangements therefor}
- 3/625 {Arrangements in the private branch exchange}
- 3/627 {Details}
- 3/64 . Distributing or queueing
- 3/645 . . {Circuit arrangements therefor}
- 3/66 . . Traffic distributors
- 3/665 {Circuit arrangements therefor}
- 3/68 . . Grouping or interlacing selector groups or stages
- 3/685 {Circuit arrangements therefor}
- 3/70 . Identification of class of calling subscriber
- 3/72 . Finding out and indicating number of calling subscriber
- 3/74 . . Identification of subscriber calling from a party-line
- 3/76 . Translation from the called subscriber's number to the outgoing or incoming control information
- 3/78 . Temporary storage of information of calling or called subscriber (intermediate storage means for telegraphic communication H04L 13/08)
- 5/00** **Selecting arrangements wherein two or more subscriber stations are connected by the same line to the exchange**
- 5/02 . with direct connection for all subscribers, i.e. party-line systems (H04Q 5/24 takes precedence)
- 5/04 . . Signalling by currents in one or other or both line wires or additional wires
- 5/06 . . Signalling by amplitude or polarity of dc
- 5/08 . . Signalling by continuous ac
- 5/10 . . . using single frequencies for different subscribers
- 5/12 . . . using combinations of frequencies
- 5/14 . . Signalling by pulses
- 5/16 . . . by predetermined number of pulses
- 5/18 . with indirect connection, i.e. through subordinate switching centre
- 5/20 . . the subordinate centre permitting interconnection of subscribers connected thereto
- 5/22 . . the subordinate centre not permitting interconnection of subscribers connected thereto
- 5/24 . for two-party-line systems
- 5/245 . . {Circuit arrangements in which for one subscriber low frequency speech and/or signalling signals proceed on the line, while for the other subscriber the low frequency speech and/or signalling signals are modulated upon a high frequency carrier signal}
- 9/00** **Arrangements in telecontrol or telemetry systems for selectively calling a substation from a main station, in which substation desired apparatus is selected for applying a control signal thereto or for obtaining measured values therefrom**
- 9/02 . Automatically-operated arrangements
- 9/04 . Arrangements for synchronous operation
- 9/06 . Calling by using amplitude or polarity of dc
- 9/08 . Calling by using continuous ac
- 9/10 . . using single different frequencies
- 9/12 . . using combinations of frequencies
- 9/14 . Calling by using pulses
- 9/16 . . by predetermined number of pulses
- 11/00** **Selecting arrangements for multiplex systems (multiplex systems H04J)**
- 11/0001 . {using optical switching}

11/0003	. . . {Details}	2011/009	. . . {Topology aspects}
11/0005	. . . {Switch and router aspects}	2011/0092	. . . . {Ring}
2011/0007	. . . {Construction}	2011/0094	. . . . {Star}
2011/0009	. . . . {using wavelength filters}	2011/0096	. . . . {Tree}
2011/0011	. . . . {using wavelength conversion}	2011/0098	. . . . {Mesh}
2011/0013	. . . . {using gating amplifiers}	11/02	. for frequency-division multiplexing {(H04Q 11/0001 takes precedence)}
2011/0015	. . . . {using splitting combining}	11/023	. . {using a stored programme control}
2011/0016	. . . . {using wavelength multiplexing or demultiplexing}	11/026	. . . {Details}
2011/0018	. . . . {using tunable transmitters or receivers}	11/04	. for time-division multiplexing {(H04Q 11/0001 takes precedence)}
2011/002	. . . . {using optical delay lines or optical buffers or optical recirculation}	11/0407	. . {using a stored programme control}
2011/0022	. . . . {using fibre gratings}	11/0414	. . . {Details}
2011/0024	. . . . {using space switching}	11/0421	. . {Circuit arrangements therefor}
2011/0026	. . . . {using free space propagation (e.g. lenses, mirrors)}	11/0428	. . {Integrated services digital network, i.e. systems for transmission of different types of digitised signals, e.g. speech, data, telecentral, television signals}
2011/0028	. . . . . {using holograms}	11/0435	. . . {Details}
2011/003	. . . . . {using switches based on microelectro-mechanical systems [MEMS]}	11/0442	. . . . {Exchange access circuits}
2011/0032	. . . . {using static wavelength routers (e.g. arrayed waveguide grating router [AWGR])}	11/045	. . . . {Selection or connection testing arrangements}
2011/0033	. . . . {using time division switching}	11/0457	. . . . {Connection protocols}
2011/0035	. . . . {using miscellaneous components, e.g. circulator, polarisation, acousto/thermo optical}	11/0464	. . . . {Primary rate access circuits}
2011/0037	. . . {Operation}	11/0471	. . . . {Terminal access circuits}
2011/0039	. . . . {Electrical control}	11/0478	. . . {Provisions for broadband connections}
2011/0041	. . . . {Optical control}	11/0485	. . . . {Circuit arrangements therefor}
2011/0043	. . . . {Fault tolerance}	11/0492	. . . . . {Details}
2011/0045	. . . . {Synchronisation}	11/06	. . Time-space-time switching
2011/0047	. . . . {Broadcast; Multicast}	11/08	. . Time only switching
2011/0049	. . . . {Crosstalk reduction; Noise; Power budget}	2201/00	Constructional details of selecting arrangements
2011/005	. . . . {Arbitration and scheduling}	2201/02	. Details of frames
2011/0052	. . . {Interconnection of switches}	2201/04	. Modular construction
2011/0054	. . . . {Distribute-route}	2201/06	. Cooling arrangements
2011/0056	. . . . {Clos}	2201/08	. Pivotal parts
2011/0058	. . . . {Crossbar; Matrix}	2201/10	. Housing details
2011/006	. . . . {Full mesh}	2201/12	. Printed circuits
11/0062	. . {Network aspects}	2201/14	. Screening, grounding or crosstalk reduction details
2011/0064	. . . {Arbitration, scheduling or medium access control aspects}	2201/16	. Coaxial cable connectors
11/0066	. . . {Provisions for optical burst or packet networks}	2201/18	. Rails
11/0067	. . . {Provisions for optical access or distribution networks, e.g. Gigabit Ethernet Passive Optical Network (GE-PON), ATM-based Passive Optical Network (A-PON), PON-Ring}	2201/80	. in specific systems
2011/0069	. . . {using dedicated optical channels}	2201/802	. . in data transmission systems
11/0071	. . . {Provisions for the electrical-optical layer interface}	2201/804	. . in optical transmission systems
2011/0073	. . . {Provisions for forwarding or routing, e.g. lookup tables}	2201/806	. . in PBX or KTS systems
2011/0075	. . . {Wavelength grouping or hierarchical aspects}	2201/808	. . in wireless transmission systems
2011/0077	. . . {Labelling aspects, e.g. multiprotocol label switching [MPLS], G-MPLS, MPAS}	2209/00	Arrangements in telecontrol or telemetry systems
2011/0079	. . . {Operation or maintenance aspects}	2209/10	. using a centralized architecture
2011/0081	. . . . {Fault tolerance; Redundancy; Recovery; Reconfigurability}	2209/20	. using a distributed architecture
2011/0083	. . . . {Testing; Monitoring}	2209/25	. . using a mesh network, e.g. a public urban network such as public lighting, bus stops or traffic lights
2011/0084	. . . {Quality of service aspects}	2209/30	. using a wired architecture
2011/0086	. . . {Network resource allocation, dimensioning or optimisation}	2209/40	. using a wireless architecture
2011/0088	. . . {Signalling aspects}	2209/43	. . using wireless personal area networks [WPAN], e.g. 802.15, 802.15.1, 802.15.4, Bluetooth or ZigBee
		2209/47	. . using RFID associated with sensors
		2209/50	. using a mobile data collecting device, e.g. walk by or drive by
		2209/60	. for transmitting utility meters data, i.e. transmission of data from the reader of the utility meter

2209/70	. Arrangements in the main station, i.e. central controller	2213/068	. Final selector
2209/75	. . by polling or interrogating the sub-stations	2213/069	. Panel switches
2209/753	. . . where the polling of the sub-stations is synchronous	2213/07	. Call distribution; Call detection; Call signalling by common apparatus
2209/756	. . . where the polling of the sub-stations is cyclic, e.g. round-robin	2213/072	. Sequence circuits
2209/80	. Arrangements in the sub-station, i.e. sensing device	2213/076	. Distributing frame; Cross connect
2209/82	. . where the sensing device takes the initiative of sending data	2213/08	. Power supply
2209/823	. . . where the data is sent when the measured values exceed a threshold, e.g. sending an alarm	2213/082	. Phantom circuits
2209/826	. . . where the data is sent periodically	2213/09	. Subscriber related equipment; Analog terminal
2209/84	. . Measuring functions	2213/091	. Indication of kind/number of subscriber
2209/845	. . . where the measuring is synchronized between sensing devices	2213/092	. Scanning of (subscriber) lines, registers, translators
2209/86	. . Performing a diagnostic of the sensing device	2213/093	. Personal computer
2209/88	. . Providing power supply at the sub-station	2213/094	. Range extender
2209/883	. . . where the sensing device enters an active or inactive mode	2213/095	. User access; PIN code
2209/886	. . . using energy harvesting, e.g. solar, wind or mechanical	2213/096	. Digital subscriber terminal
2213/00	Indexing scheme relating to selecting arrangements in general and for multiplex systems	2213/097	. Numbering
2213/001	. Motorselectors	2213/098	. Mobile subscriber
2213/002	. Graphical representation	2213/099	. Loop multiplexer (not ISDN BRI/PRI; not 381), e.g. loop splitter
2213/003	. Constructional details	2213/10	. Register
2213/011	. Periodic optical structures, e.g. gratings, holograms	2213/101	. Discriminating selectors
2213/012	. Tunable optical systems	2213/102	. Common translator
2213/013	. Optical shutters, e.g. LCD arrays	2213/103	. Memories
2213/014	. Optical storage, not delay lines	2213/104	. Central control; Computer control
2213/015	. 3D-optical arrangement	2213/106	. Microcomputer; Microprocessor
2213/016	. Optical subcarrier modulation	2213/107	. Control equipment for part of the connection
2213/017	. Optical polarisation	2213/109	. Initialising; Downloading of parameters or program routines
2213/02	. Relay switches	2213/11	. Sequence switches
2213/03	. PAM	2213/12	. Call indicator, e.g. number indicator
2213/031	. PCM	2213/121	. Marker
2213/032	. Delta modulation	2213/124	. Pulse distributor
2213/033	. Other modulation methods	2213/13	. Charging
2213/034	. Codec; PCM compression	2213/13001	. Step by step switches
2213/036	. Series parallel conversion; Parallel bit transmission	2213/13003	. Constructional details of switching devices
2213/037	. Resonant transfer; Sample and hold	2213/1301	. Optical transmission, optical switches
2213/038	. Optical modulation	2213/13012	. Hybrid fiber coax, HFC
2213/04	. Coordinate switches; Crossbar switches	2213/13016	. Optical subcarrier modulation
2213/042	. Elements placed in matrix relation, not serving as connection switch	2213/1302	. Relay switches
2213/046	. Binary switch (Beta element)	2213/1303	. Pulse amplitude modulation, PAM
2213/05	. Software aspects	2213/13031	. Pulse code modulation, PCM
2213/052	. Multi-tasking	2213/13034	. A/D conversion, code compression/expansion
2213/053	. Priority levels	2213/13036	. Serial/parallel conversion, parallel bit transmission
2213/054	. Expert systems, e.g. neural networks	2213/13038	. Optical modulation
2213/055	. Linked lists	2213/13039	. Asymmetrical two-way transmission, e.g. ADSL, HDSL
2213/056	. Software routines, e.g. finite state machines	2213/1304	. Coordinate switches, crossbar, 4/2 with relays, coupling field
2213/058	. IRQ	2213/13046	. Binary switch, β -element
2213/061	. Preselector; Second line switch	2213/1305	. Software aspects
2213/062	. Finder switch (e.g. line finder, call finder)	2213/13051	. Software generation
2213/063	. Strowger-switch as finder switch	2213/13052	. Multitasking
2213/064	. Cascaded finder or preselector switches	2213/13053	. Priority levels
2213/065	. Group selector	2213/13054	. Expert system
2213/066	. Switch with two or more wipersets	2213/13056	. Routines, finite state machines
2213/067	. Finder switch serving as final selector	2213/13057	. Object-oriented software
		2213/13058	. Interrupt request
		2213/1307	. Call setup
		2213/13072	. Sequence circuits for call signaling, ACD systems
		2213/13076	. Distributing frame, MDF, cross-connect switch
		2213/1308	. Power supply
		2213/13082	. Power supply via phantom line

- 2213/1309 . Apparatus individually associated with a subscriber line, line circuits
- 2213/13091 . CLI, identification of calling line
- 2213/13092 . Scanning of subscriber lines, monitoring
- 2213/13093 . Personal computer, PC
- 2213/13094 . Range extender
- 2213/13095 . PIN / Access code, authentication
- 2213/13096 . Digital apparatus individually associated with a subscriber line, digital line circuits
- 2213/13097 . Numbering, addressing
- 2213/13098 . Mobile subscriber
- 2213/13099 . Loop multiplexer
- 2213/131 . Register
- 2213/13102 . Common translator
- 2213/13103 . Memory
- 2213/13104 . Central control, computer control
- 2213/13106 . Microprocessor, CPU
- 2213/13107 . Control equipment for a part of the connection, distributed control, co-processing
- 2213/13109 . Initializing, personal profile
- 2213/13121 . Marker
- 2213/13124 . Pulse distributor
- 2213/1313 . Metering, billing
- 2213/13134 . Coin boxes, payphone, prepaid
- 2213/13136 . Collect call ([information service H04Q 2213/13376](#))
- 2213/13138 . Least cost routing, LCR
- 2213/13139 . Fraud detection/prevention
- 2213/13141 . Hunting for free outlet, circuit or channel
- 2213/13144 . Searching path through number of switching stages or nodes, e.g. revertive blocking
- 2213/13145 . Rerouting upon failure
- 2213/13146 . Rerouting upon blocking/overload, rearrangement
- 2213/13148 . Maximum profit routing
- 2213/13149 . Change of provider, e.g. network or service
- 2213/1315 . Call waiting
- 2213/13152 . Callback
- 2213/13156 . Automatic digit redialling, automatic call retry
- 2213/1316 . Service observation, testing
- 2213/13162 . Fault indication and localisation
- 2213/13163 . Fault alarm
- 2213/13164 . Traffic (registration, measurement,...)
- 2213/13166 . Fault prevention
- 2213/13167 . Redundant apparatus
- 2213/13168 . Error Correction
- 2213/13172 . Supervisory signals
- 2213/13173 . Busy signals
- 2213/13174 . Data transmission, file transfer
- 2213/13175 . Graphical user interface [GUI], WWW interface, visual indication
- 2213/13176 . Common channel signaling, CCS7
- 2213/13178 . Control signals
- 2213/13179 . Fax, still picture
- 2213/1318 . Ringing
- 2213/1319 . Amplifier, attenuation circuit, echo suppressor
- 2213/13191 . Repeater
- 2213/13194 . Four wire connection, transmission
- 2213/13196 . Connection circuit/link/trunk/junction, bridge, router, gateway
- 2213/13199 . Modem, modulation
- 2213/132 . Multiple-zone-metering
- 2213/13201 . Change-over of service during connection
- 2213/13202 . Network termination [NT]
- 2213/13203 . Exchange termination [ET]
- 2213/13204 . Protocols
- 2213/13205 . Primary rate access, PRI
- 2213/13206 . User-to-user signaling, UUS
- 2213/13208 . Inverse multiplexing, channel bonding, e.g. TSSI aspects
- 2213/13209 . ISDN
- 2213/13213 . Counting, timing circuits
- 2213/13214 . Clock signals
- 2213/13215 . Code checking, CRC
- 2213/13216 . Code signals, frame structure
- 2213/13217 . Crankback in routing, trombone connection, loopback circuit
- 2213/1322 . PBX
- 2213/13222 . PBX circuits in public exchange, centrex
- 2213/13224 . Off-net subscriber, dial in to/out from network, teleworking
- 2213/1323 . Party line
- 2213/1324 . Conference call
- 2213/13242 . Broadcast, diffusion, multicast, point-to-multipoint (1 : N)
- 2213/13246 . Instant speaker's algorithm [ISA]
- 2213/13248 . Multimedia
- 2213/1325 . Priority service
- 2213/13251 . Restricted service, class of service
- 2213/13256 . Call screening
- 2213/1326 . Consultation call, broker's call, call hold, toggling
- 2213/1327 . Release and resetting of connection
- 2213/13271 . Forced release
- 2213/13272 . Premature release
- 2213/13274 . Call rejection, call barring
- 2213/1328 . Call transfer, e.g. in PBX
- 2213/13281 . Call transfer/forward at night
- 2213/13282 . Call forward, follow-me, call diversion
- 2213/13284 . Call tracing
- 2213/13286 . Direct in-dialling in PBX, DDI
- 2213/13287 . Wake-up call service
- 2213/13288 . Closed user groups, CUG
- 2213/1329 . Asynchronous transfer mode, ATM
- 2213/13291 . Frequency division multiplexing, FDM
- 2213/13292 . Time division multiplexing, TDM
- 2213/13293 . TASI, irregular time division, burst switching
- 2213/13294 . CDMA, code division multiplexing, i.e. combinations of [H04Q 2213/13291](#) and/or [H04Q 2213/13292](#) with space division
- 2213/13295 . Wavelength multiplexing, WDM
- 2213/13296 . Packet switching, X.25, frame relay
- 2213/13297 . Coupling different rates in TDM systems, data rate adaptation
- 2213/13298 . Local loop systems, access network
- 2213/13299 . Bus
- 2213/133 . Multiple-time-metering
- 2213/13302 . Magnetic elements
- 2213/13305 . Transistors, semiconductors in general
- 2213/13306 . Ferro-electric elements
- 2213/1331 . Delay elements, shift registers
- 2213/1332 . Logic circuits
- 2213/13322 . Integrated circuits
- 2213/1333 . Random systems
- 2213/13331 . Abbreviated dialling
- 2213/13332 . Broadband, CATV, dynamic bandwidth allocation
- 2213/13333 . Earth satellites

- 2213/13334 . Key telephone systems
- 2213/13335 . Simulation, emulation
- 2213/13336 . Store & forward, messaging systems ([email H04Q 2213/13375](#))
- 2213/13337 . Picturephone, videotelephony
- 2213/13338 . Do-not-disturb
- 2213/13339 . Ciphering, encryption, security
- 2213/1334 . Configuration within the switch
- 2213/13341 . Connections within the switch
- 2213/13342 . Arrangement of switches in the network
- 2213/13343 . Neural networks
- 2213/13344 . Overflow
- 2213/13345 . Intelligent networks, SCP
- 2213/13348 . Channel/line reservation
- 2213/13349 . Network management
- 2213/13352 . Self-routing networks, real-time routing
- 2213/13353 . Routing table, map memory
- 2213/1336 . Synchronisation
- 2213/13361 . Synchronous systems
- 2213/13362 . Asynchronous systems
- 2213/13363 . Pulse stuffing, bit stuffing
- 2213/13367 . Hierarchical multiplexing, add-drop multiplexing
- 2213/1337 . Operator, emergency services
- 2213/13372 . Intercepting operator
- 2213/13374 . Paging
- 2213/13375 . Electronic mail
- 2213/13376 . Information service, downloading of information, 0800/0900 services
- 2213/13377 . Recorded announcement
- 2213/13378 . Speech recognition, speech analysis
- 2213/1338 . Inter-exchange connection
- 2213/13381 . Pair-gain system, digital loop carriers
- 2213/13383 . Hierarchy of switches, main and subexchange, e.g. satellite exchange
- 2213/13384 . Inter-PBX traffic, PBX networks, e.g. corporate networks
- 2213/13385 . Off-net subscriber
- 2213/13386 . Line concentrator
- 2213/13387 . Call gapping
- 2213/13388 . Saturation signaling systems
- 2213/13389 . LAN, internet
- 2213/1339 . Fixed association of channels
- 2213/13391 . Channel assigned to connections
- 2213/13392 . Channels assigned according to rules
- 2213/13393 . Time slot switching, T-stage, time slot interchanging, TSI
- 2213/13395 . Permanent channel, leased line
- 2213/13396 . Signaling in general, in-band signalling
- 2213/13399 . Virtual channel/circuits
- 2213/134 . Coin box
- 2213/13402 . Data transmission out of voice frequency band ([ADSL H04Q 2213/13039](#))
- 2213/13405 . Dual frequency signaling, DTMF
- 2213/13407 . Detection of data transmission mode
- 2213/135 . Service creation
- 2213/13501 . Feature interactions
- 2213/13502 . primitives - inc. service-independent building blocks [SIBBs]
- 2213/13503 . object-oriented systems
- 2213/13504 . client/server architectures
- 2213/13505 . management information base [MIB]
- 2213/13511 . reservation
- 2213/13512 . 800 - freefone
- 2213/13513 . UPT - personal as opposed to terminal mobility, inc. number portability
- 2213/13514 . quality of service - inc. grade of service
- 2213/13515 . authentication, authorisation - fraud prevention
- 2213/13516 . agents or brokers - user, terminal etc., also OSI agent/managers
- 2213/13517 . SLEE - service logic execution
- 2213/13521 . fault management
- 2213/13522 . traffic management
- 2213/13523 . bandwidth management, e.g. capacity management
- 2213/13524 . cost management ([least cost H04Q 2213/13138](#))
- 2213/13525 . GUI - graphical user interface, inc. for service creation
- 2213/13526 . resource management
- 2213/13527 . protocols - X.25, TCAP etc.
- 2213/13528 . SCP architecture
- 2213/13531 . virtual networks - inc. PVN
- 2213/13532 . mobile networks
- 2213/13533 . multivendor and hybrid, e.g. public/private, networks, inc. international
- 2213/13534 . Internet - WWW, HTML, browsers etc.
- 2213/13535 . distributed systems - also domains in service creation
- 2213/13541 . routing
- 2213/13542 . numbering plans, e.g. number re-allocation
- 2213/13543 . network planning, configuration management, e.g. for growth
- 2213/13544 . modeling or simulation, particularly of networks
- 2213/13545 . monitoring of signaling messages, intelligent network
- 2213/13546 . Intelligent Peripheral
- 2213/13547 . subscriber, e.g. profile, database, database access
- 2213/13548 . call modeling, e.g. Basic Call State Model
- 2213/13561 . congestion - inc. overflow
- 2213/13562 . blocking
- 2213/13563 . call gapping, e.g. to prevent congestion
- 2213/13564 . load balancing
- 2213/13565 . restoration, e.g. disaster recovery, self-healing networks
- 2213/13566 . mediation
- 2213/13567 . negotiation, management policy, goals
- 2213/136 . Collect call, e.g. 800 service
- 2213/138 . Least cost routing
- 2213/14 . Busy test, e.g. marking busy
- 2213/141 . Hunting for free outlet, circuit, channel
- 2213/144 . Searching a free path through cascaded switching stages
- 2213/145 . Rerouting, e.g. on failure
- 2213/146 . Rearrangement
- 2213/15 . Waiting
- 2213/152 . Automatic call retry
- 2213/156 . Automatic redialling
- 2213/16 . Service observation; Fault circuit; Testing
- 2213/161 . Blocking or cutoff of faulty apparatus, e.g. timed out
- 2213/162 . Fault indication, e.g. localisation
- 2213/163 . Fault alarm
- 2213/164 . Traffic registration; Adaptation of traffic possibilities
- 2213/166 . Prevention of faults
- 2213/167 . Redundancy

- 2213/171 . Number indicating signals (no dial signals)
- 2213/172 . Supervisory signals
- 2213/173 . Busy signal
- 2213/174 . Data transmission
- 2213/175 . Other signals
- 2213/176 . Common channel signalling
- 2213/177 . Number sending signals, e.g. dialling tone, proceed to send
- 2213/178 . Control signals, e.g. also service connection
- 2213/179 . Facsimile; Fax, e.g. still picture
- 2213/18 . Ringing
- 2213/182 . Ring trip
- 2213/19 . Echo-cancelling; Hybrid; Amplifier; Attenuator
- 2213/191 . Repeater
- 2213/192 . Common amplifier for bidirectional traffic
- 2213/194 . Four-wire connection or transmission
- 2213/196 . Connection-circuit; Trunk; Junction circuit
- 2213/197 . Ping-pong transmission
- 2213/198 . Temporary associated devices; Pooled adapters
- 2213/199 . Modem
- 2213/20 . ISDN
- 2213/201 . Change-over service
- 2213/202 . Network termination [NT]
- 2213/203 . Exchange termination [ET]
- 2213/204 . ISDN protocol; ISO 7
- 2213/205 . Primary rate access
- 2213/206 . User-to-user signalling
- 2213/208 . Inverse multiplexing; Time slot sequence integrity [TSSI] aspects
- 2213/21 . Impulse transmission
- 2213/211 . Impulse correction or reshaping
- 2213/212 . Absorbing of digits
- 2213/214 . Phase shifted impulses; Clock signals; Timing
- 2213/215 . Code checking
- 2213/216 . Code signals; Framing (not synchronizing)
- 2213/217 . Setting of switch by means of pulses
- 2213/218 . Bistable relays, e.g. Ferreed
- 2213/22 . PBX
- 2213/222 . PBX circuits in public exchange (Centrex)
- 2213/23 . Partyline
- 2213/24 . Conference circuit
- 2213/242 . Broadcast and multicast (1:N)
- 2213/243 . Con-cast, e.g. multipoint-point (N:1)
- 2213/246 . Instant speaker's algorithm [ISA]
- 2213/25 . Preferential service
- 2213/251 . Restricted service
- 2213/252 . Breaking-in on existing connection
- 2213/256 . Call screening
- 2213/26 . Call-back
- 2213/27 . Release
- 2213/271 . Forced release
- 2213/272 . Premature release
- 2213/274 . Call rejection
- 2213/28 . Call transfer
- 2213/281 . Prepared call transfer, e.g. night service, intercepting service
- 2213/282 . Call forwarding
- 2213/284 . Call tracing
- 2213/286 . Direct inward dialling [PBX]
- 2213/287 . Call service, e.g. morning call service
- 2213/29 . ATM
- 2213/291 . Frequency division multiplex
- 2213/292 . Time (de)multiplexing
- 2213/293 . Irregular time switching, e.g. TASI; Burst switching
- 2213/294 . Other multiplexing systems, e.g. codemultiplex, TDM, FDM, FDM and Space division, TDM and Space division
- 2213/295 . Wavelength division multiplex
- 2213/296 . Packet switching
- 2213/297 . Coupling circuits between different (rate) TDM systems
- 2213/298 . Loop or ring system
- 2213/299 . Bus
- 2213/301 . Tubes and other non-linear elements with 2 electrodes, e.g. diodes
- 2213/302 . Magnetic elements
- 2213/303 . Tubes and other non-linear elements with more than two electrodes
- 2213/304 . Superconductors; Thermistors; Varistors
- 2213/305 . Transistors
- 2213/306 . Ferro-electric elements
- 2213/307 . Hall elements
- 2213/308 . Photo conductors; Photo elements
- 2213/31 . Delay devices; Circuits, e.g. shift memories
- 2213/32 . Logic elements
- 2213/322 . Integrated circuit
- 2213/33 . Special systems; Special service
- 2213/331 . Abbreviated dialing
- 2213/332 . Broadband system
- 2213/333 . Systems with earth-satellites
- 2213/334 . Key telephone system
- 2213/335 . Simulation
- 2213/336 . Store and forward, e.g. message switching
- 2213/337 . Picturephone
- 2213/338 . Do not disturb
- 2213/339 . Ciphering/encryption
- 2213/34 . General scheme; Position of components in an exchange
- 2213/341 . Contactbank connections
- 2213/342 . General scheme; Position of exchanges
- 2213/343 . Neural network
- 2213/344 . Overflow
- 2213/345 . Intelligent network
- 2213/346 . Switch with inverted grouping
- 2213/347 . Nodal network
- 2213/348 . Reservation of lines/channels
- 2213/349 . Network management; Expert system
- 2213/35 . Separate control and speech paths, e.g. route-searching planes
- 2213/352 . Self-routing switch
- 2213/353 . Map memory
- 2213/36 . Synchronisation
- 2213/361 . Synchronous system
- 2213/362 . Asynchronous system
- 2213/363 . Bit or pulse stuffing
- 2213/366 . Integrated systems, e.g. transparency
- 2213/367 . Multiple multiplexing; Hierarchical multiplexing
- 2213/37 . Operator
- 2213/372 . Intervention by operator; Intercepting operator
- 2213/374 . Paging
- 2213/375 . Electronic mail
- 2213/376 . Information service
- 2213/377 . Recorded announcement

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- 2213/378 . Speech recognition; Speech analysis
- 2213/38 . Interexchange connections, e.g. connections of different kinds of networks
- 2213/381 . Pair gain system
- 2213/382 . Provisions for interexchange traffic in the local exchange
- 2213/383 . Main and subexchange, e.g. satellite exchanges
- 2213/384 . Inter-PBX traffic; PBX networks
- 2213/385 . Traffic in PBX to and from public exchange
- 2213/386 . Line concentrator
- 2213/388 . Saturation signalling system
- 2213/39 . Channels assigned to subscribers
- 2213/391 . Channel allocation to connections
- 2213/392 . Channel allocation - special rules
- 2213/393 . Channel interchanging, e.g. time slot switching
- 2213/394 . Channel assignment without time slot switching
- 2213/395 . (Semi)permanent channels, e.g. leased lines
- 2213/396 . Signalling in general; Special register channel
- 2213/399 . Virtual channel allocation
- 2213/401 . DC and voltages of different kinds or values
- 2213/402 . AC outside voice band
- 2213/403 . Voice frequency
- 2213/405 . Voice frequency current used for digit selection
- 2213/407 . Push-button dialling (not [H04Q 2213/405](#))