

CPC**COOPERATIVE PATENT CLASSIFICATION****H04Q****SELECTING** (switches, relays, selectors [H01H](#); electronic switches [H03K 17/00](#))**NOTE**

1. This subclass covers:
 - methods, circuits, or apparatus for stablishing selectively a connect ion 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.

H04Q 1/00**Details of selecting apparatus or arrangements { for establishing connections among stations for the purpose of transferring information via these connections}**

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|------------|---|
| H04Q 1/02 | . Constructional details |
| H04Q 1/021 | .. {using pivoting mechanisms for accessing the interior of the apparatus} |
| H04Q 1/023 | .. {using sliding mechanisms for accessing the interior of the apparatus} |
| H04Q 1/025 | .. {Cabinets} |
| H04Q 1/026 | ... {characterized by door details} |
| H04Q 1/028 | .. {Subscriber network interface devices (line interfacing in the subscriber set H04M 1/0293)} |
| H04Q 1/03 | .. {Power distribution arrangements} |
| H04Q 1/032 | ... {power failure protection} |
| H04Q 1/035 | .. {Cooling of active equipments, e.g. air ducts} |
| H04Q 1/04 | .. Frames or mounting racks for selector switches; Accessories therefor, e.g. frame cover |
| H04Q 1/06 | .. Cable ducts or mountings specially adapted for exchange installations (in general H02G) |
| H04Q 1/062 | ... {vertical management arrangements} |
| H04Q 1/064 | ... {horizontal management arrangements} |
| H04Q 1/066 | ... {arranged on the front side} |
| H04Q 1/068 | ... {arranged on the rear side} |

H04Q 1/08	..	Frames or mounting racks for relays; Accessories therefor
H04Q 1/09	..	{Frames or mounting racks not otherwise provided for}
H04Q 1/10	..	Exchange station construction
H04Q 1/11	..	{Protection against environment}
H04Q 1/112	...	{mechanical protection, e.g. resistance to earthquakes}
H04Q 1/114	...	{flooding protection, e.g. using water proof provision}
H04Q 1/116	...	{lightning or EMI protection, e.g. shielding or grounding (suppression of noise or interference in transmission systems H04B 15/00)}
H04Q 1/118	...	{heat or sun protection}
H04Q 1/12	..	Arrangements of multiple bars with or without pivotable frames
H04Q 1/13	..	{Patch panels for monitoring, interconnecting or testing circuits, e.g. patch bay, patch field or jack field; Patching modules}
H04Q 1/131	...	{being pivotable}
H04Q 1/133	...	{being slidable}
H04Q 1/135	...	{characterized by patch cord details}
H04Q 1/136	....	{having patch field management or physical layer management arrangements}
H04Q 1/138	.....	{using RFID}
H04Q 1/14	..	Distribution frames
H04Q 1/141	...	{Details of connexions between cable and distribution frame}
H04Q 1/142	...	{Terminal blocks for distribution frames}
H04Q 1/143	...	{with contacts on circular surface}
H04Q 1/144	...	{Plugs used in distribution frames}
H04Q 1/145	...	{with switches arranged in a matrix configuration}
H04Q 1/146	...	{with line protection means}
H04Q 1/147	...	{using robots for distributing}
H04Q 1/148	...	{Identification strips for distribution frames}
H04Q 1/149	...	{Wireguides in connector blocks}
H04Q 1/15	..	{Backplane arrangements}
H04Q 1/155	...	{characterised by connection features}
H04Q 1/16	..	Wiring arrangements for selector switches or relays in frames
H04Q 1/18	.	Electrical details
H04Q 1/20	..	Testing circuits or apparatus; Circuits or apparatus for detecting, indicating, or signalling faults or troubles
H04Q 1/22	...	Automatic arrangements
H04Q 1/24	....	for connection devices
H04Q 1/245	.....	{in time-division multiplex systems}
H04Q 1/26	....	for signalling trouble in unoccupied sub-exchanges
H04Q 1/28	..	Current-supply circuits or arrangements for selection equipment at exchanges
H04Q 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)

H04Q 1/32	...	using trains of dc pulses (H04Q 1/39 takes precedence)
H04Q 1/34	....	Impulse regenerators with mechanical or other non-electrical marking arrangements
H04Q 1/36	....	Pulse-correcting arrangements, e.g. for reducing effects due to interference
H04Q 1/38	...	using combinations of direct currents of different amplitudes or polarities over line conductors or combination of line conductors
H04Q 1/39	...	using coded pulse groups
H04Q 1/40	...	whereby duration of pulse or interval between two pulses is variable
H04Q 1/42	....	involving the position of a pulse in a cycle
H04Q 1/44	...	using alternate current (H04Q 1/50 takes precedence)
H04Q 1/442	....	with out-of-voice band signalling frequencies
H04Q 1/4423	.....	{using one signalling frequency}
H04Q 1/4426	.....	{using two or more signalling frequencies, transmitted in succession or simultaneously}
H04Q 1/444	....	with voice-band signalling frequencies
H04Q 1/446	.....	using one signalling frequency (H04Q 1/46 takes precedence)
H04Q 1/4465	.....	{the same frequency being used for all signalling information, e.g. A.C. nr.9 system}
H04Q 1/448	.....	with conversion of a single frequency signal into a digital signal
H04Q 1/4485	.....	{which is transmitted in digital form}
H04Q 1/45	....	using multi-frequency signalling (H04Q 1/46 takes precedence)
H04Q 1/453	.....	in which m-out-of-n signalling frequencies are transmitted
H04Q 1/4535	.....	{with an additional signal transmitted for voice protection}
H04Q 1/457	.....	with conversion of multifrequency signals into digital signals
H04Q 1/4575	.....	{which are transmitted in digital form}
H04Q 1/46	....	comprising means for distinguishing between a signalling current of predetermined frequency and a complex current containing that frequency, e.g. speech current
H04Q 1/48	...	Induced-current signalling arrangements
H04Q 1/50	...	Conversion between different kinds of signals
H04Q 1/54	..	Amplifier switched-on automatically in dependence on automatically-selected lines
H04Q 1/56	..	Balancing circuitry switched-on automatically in dependence on automatically-selected lines
H04Q 3/00		Selecting arrangements (H04Q 5/00 to H04Q 11/00 take precedence)
H04Q 3/0004	.	{using crossbar selectors in the switching stages}
H04Q 3/0008	.	{using relay selectors in the switching stages}
H04Q 3/0012	..	{in which the relays are arranged in a matrix configuration}
H04Q 3/0016	.	{Arrangements providing connection between exchanges}
H04Q 3/002	..	{Details}
H04Q 3/0025	..	{Provisions for signalling (circuitry in H04Q 1/30)}
H04Q 3/0029	..	{Provisions for intelligent networking}

H04Q 3/0033	...	{customer-controlled}
H04Q 3/0037	...	{involving call modelling techniques, e.g. modifications to the basic call state model (BCSM)}
H04Q 3/0041	...	{involving techniques for avoiding interaction of call service features}
H04Q 3/0045	...	{involving hybrid, i.e. a mixture of public and private, or multi-vendor systems}
H04Q 3/005	...	{Personal communications services, e.g. provisions for portability of subscriber numbers (subscriber services provided at exchanges H04M 3/42)}
H04Q 3/0054	...	{Service creation techniques}
H04Q 3/0058	....	{using service-independent building blocks (SIBBs) or "primitives"}
H04Q 3/0062	..	{Provisions for network management}
H04Q 3/0066	...	{Bandwidth allocation or management}
H04Q 3/007	...	{customer-controlled}
H04Q 3/0075	...	{Fault management techniques}
H04Q 3/0079	....	{involving restoration of networks, e.g. disaster recovery, self-healing networks}
H04Q 3/0083	...	{Network planning or design; Modelling of planned or existing networks}
H04Q 3/0087	...	{Network testing or monitoring arrangements}
H04Q 3/0091	...	{Congestion or overload control}
H04Q 3/0095	...	{Specification, development or application of network management software, e.g. software re-use}
H04Q 3/02	.	Circuit arrangements for selectors responsive to a permutation code
H04Q 3/04	.	Circuit arrangements for receivers of routing digits
H04Q 3/06	..	for group or trunk group selectors
H04Q 3/08	..	for local or long-distance selectors
H04Q 3/10	..	for PBX selectors, i.e. private branch exchange selectors
H04Q 3/12	..	for line selectors providing transfer of routing digits
H04Q 3/14	..	for two-way operation selectors
H04Q 3/16	..	for marking-switches
H04Q 3/18	.	Circuit arrangements for first stage of hunting switching
H04Q 3/20	..	for preselectors
H04Q 3/22	...	comprising common calling and disconnecting circuit
H04Q 3/24	..	for line finders
H04Q 3/26	...	comprising common calling and disconnecting circuit
H04Q 3/28	...	comprising main groups and subgroups
H04Q 3/30	..	Selector finders, i.e. allotters
H04Q 3/32	.	Circuit arrangements for second or subsequent stages of hunting switching
H04Q 3/34	..	for the second preselection stage
H04Q 3/36	..	for the second line-finder stage
H04Q 3/38	..	for stages after the group selector stage
H04Q 3/40	..	for stages after the line selector, e.g. for extension selector

- H04Q 3/42 . . Circuit arrangements for indirect selecting controlled by common circuits, e.g. register controller, marker
- H04Q 3/44 . . . using revertive control
- H04Q 3/46 . . . using signals other than revertive impulses
- H04Q 3/47 . . . using translators
- H04Q 3/48 . . . using markers
- H04Q 3/49 for end-to-end marking
- H04Q 3/495 for routing connecting paths
- H04Q 3/52 . . . using static devices in switching stages, e.g. electronic switching arrangements
- H04Q 3/521 {using semiconductors in the switching stages}
- H04Q 3/523 {Details}
- H04Q 3/525 {using tubes in the switching stages}
- H04Q 3/526 {Optical switching systems}
- H04Q 3/528 {Details}
- H04Q 3/54 . . . in which the logic circuitry controlling the exchange is centralised
- H04Q 3/542 {Logic circuits or arrangements therefor (logic circuits in general [H03K 19/00](#))}
- H04Q 3/545 {using a stored programme}
- H04Q 3/54508 {Configuration, initialization}
- H04Q 3/54516 {Initialization, software or data downloading ([G06F 9/445](#) takes precedence)}
- H04Q 3/54525 {Features introduction}
- H04Q 3/54533 {Configuration data, translation, passwords, databases}
- H04Q 3/54541 {using multi-processor systems}
- H04Q 3/5455 {Multi-processor, parallelism, distributed systems}
- H04Q 3/54558 {Redundancy, stand-by}
- H04Q 3/54566 {Intelligent peripherals, adjunct processors}
- H04Q 3/54575 {Software application}
- H04Q 3/54583 {Software development, e.g. procedural, object oriented, software generation, software testing}
- H04Q 3/54591 {Supervision, e.g. fault localisation, traffic measurements, avoiding errors, failure recovery, monitoring, statistical analysis}
- H04Q 3/55 . . . using wired logic circuitry
- H04Q 3/552 {Wired circuits or arrangements therefor}
- H04Q 3/555 being comprised by electro-magnetic devices
- H04Q 3/56 . . . in which the control signals are multiplexed
- H04Q 3/58 . . . Arrangements providing connection between main exchange and sub-exchange or satellite
- H04Q 3/60 . . . for connecting to satellites or concentrators which connect one or more exchange lines with a group of local lines
- H04Q 3/602 {Circuit arrangements therefor}
- H04Q 3/605 {Arrangements in the satellite or concentrator}
- H04Q 3/607 {Details}

- H04Q 3/62 . . . for connecting to private branch exchanges
- H04Q 3/622 . . . {Circuit arrangements therefor}
- H04Q 3/625 . . . {Arrangements in the private branch exchange}
- H04Q 3/627 {Details}
- H04Q 3/64 . . Distributing or queueing
- H04Q 3/645 . . {Circuit arrangements therefor}
- H04Q 3/66 . . Traffic distributors
- H04Q 3/665 . . . {Circuit arrangements therefor}
- H04Q 3/68 . . Grouping or interlacing selector groups or stages
- H04Q 3/685 . . . {Circuit arrangements therefor}
- H04Q 3/70 . . Identification of class of calling subscriber
- H04Q 3/72 . . Finding out and indicating number of calling subscriber
- H04Q 3/74 . . Identification of subscriber calling from a party-line
- H04Q 3/76 . . Translation from the called subscriber's number to the outgoing or incoming control information
- H04Q 3/78 . . Temporary storage of information of calling or called subscriber ([intermediate storage means for telegraphic communication H04L 13/08](#))

H04Q 5/00 Selecting arrangements wherein two or more subscriber stations are connected by the same line to the exchange

- H04Q 5/02 . . with direct connection for all subscribers, i.e. party-line systems ([H04Q 5/24 takes precedence](#))
- H04Q 5/04 . . Signalling by currents in one or other or both line wires or additional wires
- H04Q 5/06 . . Signalling by amplitude or polarity of dc
- H04Q 5/08 . . Signalling by continuous ac
- H04Q 5/10 . . . using single frequencies for different subscribers
- H04Q 5/12 . . . using combinations of frequencies
- H04Q 5/14 . . Signalling by pulses
- H04Q 5/16 . . . by predetermined number of pulses
- H04Q 5/18 . . with indirect connection, i.e. through subordinate switching centre
- H04Q 5/20 . . the subordinate centre permitting interconnection of subscribers connected thereto
- H04Q 5/22 . . the subordinate centre not permitting interconnection of subscribers connected thereto
- H04Q 5/24 . . for two-party-line systems
- H04Q 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}

H04Q 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

- H04Q 9/02 . . Automatically-operated arrangements

- H04Q 9/04 . Arrangements for synchronous operation
- H04Q 9/06 . Calling by using amplitude or polarity of dc
- H04Q 9/08 . Calling by using continuous ac
- H04Q 9/10 .. using single different frequencies
- H04Q 9/12 .. using combinations of frequencies
- H04Q 9/14 . Calling by using pulses
- H04Q 9/16 .. by predetermined number of pulses

H04Q 11/00**Selecting arrangements for multiplex systems (multiplex systems [H04J](#))**

- H04Q 11/0001 . {using optical switching}
- H04Q 11/0003 .. {Details}
- H04Q 11/0005 .. {Switch and router aspects}
- H04Q 2011/0007 ... {Construction}
- H04Q 2011/0009 {using wavelength filters}
- H04Q 2011/0011 {using wavelength conversion}
- H04Q 2011/0013 {using gating amplifiers}
- H04Q 2011/0015 {using splitting combining}
- H04Q 2011/0016 {using wavelength multiplexing or demultiplexing}
- H04Q 2011/0018 {using tunable transmitters or receivers}
- H04Q 2011/002 {using optical delay lines or optical buffers or optical recirculation}
- H04Q 2011/0022 {using fibre gratings}
- H04Q 2011/0024 {using space switching}
- H04Q 2011/0026 {using free space propagation (e.g. lenses, mirrors)}
- H04Q 2011/0028 {using holograms}
- H04Q 2011/003 {using switches based on micro-electro-mechanical systems (MEMS)}
- H04Q 2011/0032 {using static wavelength routers (e.g. arrayed waveguide grating router (AWGR))}
- H04Q 2011/0033 {using time division switching}
- H04Q 2011/0035 {using miscellaneous components, e.g. circulator, polarisation, acousto/thermo optical}
- H04Q 2011/0037 ... {Operation}
- H04Q 2011/0039 {Electrical control}
- H04Q 2011/0041 {Optical control}
- H04Q 2011/0043 {Fault tolerance}
- H04Q 2011/0045 {Synchronisation}
- H04Q 2011/0047 {Broadcast; Multicast}
- H04Q 2011/0049 {Crosstalk reduction; Noise; Power budget}
- H04Q 2011/005 {Arbitration and scheduling}
- H04Q 2011/0052 ... {Interconnection of switches}
- H04Q 2011/0054 {Distribute-route}
- H04Q 2011/0056 {Clos}

H04Q 2011/0058	....	{Crossbar; Matrix}
H04Q 2011/006	....	{Full mesh}
H04Q 11/0062	..	{Network aspects}
H04Q 2011/0064	...	{Arbitration, scheduling or medium access control aspects}
H04Q 11/0066	...	{Provisions for optical burst or packet networks}
H04Q 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}
H04Q 2011/0069	...	{using dedicated optical channels}
H04Q 11/0071	...	{Provisions for the electrical-optical layer interface}
H04Q 2011/0073	...	{Provisions for forwarding or routing, e.g. lookup tables}
H04Q 2011/0075	...	{Wavelength grouping or hierarchical aspects}
H04Q 2011/0077	...	{Labelling aspects, e.g. multiprotocol label switching (MPLS), G-MPLS, MPAS}
H04Q 2011/0079	...	{Operation or maintenance aspects}
H04Q 2011/0081	....	{Fault tolerance; Redundancy; Recovery; Reconfigurability}
H04Q 2011/0083	....	{Testing; Monitoring}
H04Q 2011/0084	...	{Quality of service aspects}
H04Q 2011/0086	...	{Network resource allocation, dimensioning or optimisation}
H04Q 2011/0088	...	{Signalling aspects}
H04Q 2011/009	...	{Topology aspects}
H04Q 2011/0092	....	{Ring}
H04Q 2011/0094	....	{Star}
H04Q 2011/0096	....	{Tree}
H04Q 2011/0098	....	{Mesh}
H04Q 11/02	.	for frequency-division multiplexing {(H04Q 11/0001 takes precedence)}
H04Q 11/023	..	{using a stored programme control}
H04Q 11/026	...	{Details}
H04Q 11/04	.	for time-division multiplexing {(H04Q 11/0001 takes precedence)}
H04Q 11/0407	..	{using a stored programme control}
H04Q 11/0414	...	{Details}
H04Q 11/0421	..	{Circuit arrangements therefor}
H04Q 11/0428	..	{Integrated services digital network, i.e. systems for transmission of different types of digitised signals, e.g. speech, data, telecentral, television signals}
H04Q 11/0435	...	{Details}
H04Q 11/0442	....	{Exchange access circuits}
H04Q 11/045	....	{Selection or connection testing arrangements}
H04Q 11/0457	....	{Connection protocols}
H04Q 11/0464	....	{Primary rate access circuits}
H04Q 11/0471	....	{Terminal access circuits}
H04Q 11/0478	...	{Provisions for broadband connections}

H04Q 11/0485	.... {Circuit arrangements therefor (contains no documents, see provisionally H04Q 11/0492)}
H04Q 11/0492	..... {Details}
H04Q 11/06	.. Time-space-time switching
H04Q 11/08	.. Time only switching
H04Q 2201/00	Constructional details of selecting arrangements
H04Q 2201/02	. Details of frames
H04Q 2201/04	. Modular construction
H04Q 2201/06	. Cooling arrangements
H04Q 2201/08	. Pivotal parts
H04Q 2201/10	. Housing details
H04Q 2201/12	. Printed circuits
H04Q 2201/14	. Screening, grounding or crosstalk reduction details
H04Q 2201/16	. Coaxial cable connectors
H04Q 2201/18	. Rails
H04Q 2201/80	. in specific systems
H04Q 2201/802	.. in data transmission systems
H04Q 2201/804	.. in optical transmission systems
H04Q 2201/806	.. in PBX or KTS systems
H04Q 2201/808	.. in wireless transmission systems
H04Q 2209/00	Arrangements in telecontrol or telemetry systems
H04Q 2209/10	. using a centralized architecture
H04Q 2209/20	. using a distributed architecture
H04Q 2209/25	.. using a mesh network, e.g. a public urban network such as public lighting, bus stops or traffic lights
H04Q 2209/30	. using a wired architecture
H04Q 2209/40	. using a wireless architecture
H04Q 2209/43	.. using wireless personal area networks [WPAN], e.g. 802.15, 802.15.1, 802.15.4, Bluetooth or ZigBee
H04Q 2209/47	.. using RFID associated with sensors
H04Q 2209/50	. using a mobile data collecting device, e.g. walk by or drive by
H04Q 2209/60	. for transmitting utility meters data, i.e. transmission of data from the reader of the utility meter
H04Q 2209/70	. Arrangements in the main station, i.e. central controller
H04Q 2209/75	.. by polling or interrogating the sub-stations
H04Q 2209/753	... where the polling of the sub-stations is synchronous
H04Q 2209/756	... where the polling of the sub-stations is cyclic, e.g. round-robin
H04Q 2209/80	. Arrangements in the sub-station, i.e. sensing device
H04Q 2209/82	.. where the sensing device takes the initiative of sending data

- H04Q 2209/823 . . . where the data is sent when the measured values exceed a threshold, e.g. sending an alarm
- H04Q 2209/826 . . . where the data is sent periodically
- H04Q 2209/84 . . Measuring functions
- H04Q 2209/845 . . . where the measuring is synchronized between sensing devices
- H04Q 2209/86 . . Performing a diagnostic of the sensing device
- H04Q 2209/88 . . Providing power supply at the sub-station
- H04Q 2209/883 . . . where the sensing device enters an active or inactive mode
- H04Q 2209/886 . . . using energy harvesting, e.g. solar, wind or mechanical

H04Q 2213/00 Indexing scheme relating to selecting arrangements in general and for multiplex systems

- H04Q 2213/001 . Motorselectors
- H04Q 2213/002 . Graphical representation
- H04Q 2213/003 . Constructional details
- H04Q 2213/011 . Periodic optical structures, e.g. gratings, holograms
- H04Q 2213/012 . Tunable optical systems
- H04Q 2213/013 . Optical shutters, e.g. LCD arrays
- H04Q 2213/014 . Optical storage, not delay lines
- H04Q 2213/015 . 3D-optical arrangement
- H04Q 2213/016 . Optical subcarrier modulation
- H04Q 2213/017 . Optical polarisation
- H04Q 2213/02 . Relay switches
- H04Q 2213/03 . PAM
- H04Q 2213/031 . PCM
- H04Q 2213/032 . Delta modulation
- H04Q 2213/033 . Other modulation methods
- H04Q 2213/034 . Codec; PCM compression
- H04Q 2213/036 . Series parallel conversion; Parallel bit transmission
- H04Q 2213/037 . Resonant transfer; Sample and hold
- H04Q 2213/038 . Optical modulation
- H04Q 2213/04 . Coordinate switches; Crossbar switches
- H04Q 2213/042 . Elements placed in matrix relation, not serving as connection switch
- H04Q 2213/046 . Binary switch (Beta element)
- H04Q 2213/05 . Software aspects
- H04Q 2213/052 . Multi-tasking
- H04Q 2213/053 . Priority levels
- H04Q 2213/054 . Expert systems, e.g. neural networks
- H04Q 2213/055 . Linked lists
- H04Q 2213/056 . Software routines, e.g. finite state machines
- H04Q 2213/058 . IRQ

H04Q 2213/061	. Preselector; Second line switch
H04Q 2213/062	. Finder switch (e.g. line finder, call finder)
H04Q 2213/063	. Strowger-switch as finder switch
H04Q 2213/064	. Cascaded finder or preselector switches
H04Q 2213/065	. Group selector
H04Q 2213/066	. Switch with two or more wipersets
H04Q 2213/067	. Finder switch serving as final selector
H04Q 2213/068	. Final selector
H04Q 2213/069	. Panel switches
H04Q 2213/07	. Call distribution; Call detection; Call signalling by common apparatus
H04Q 2213/072	. Sequence circuits
H04Q 2213/076	. Distributing frame; Cross connect
H04Q 2213/08	. Power supply
H04Q 2213/082	. Phantom circuits
H04Q 2213/09	. Subscriber related equipment; Analog terminal
H04Q 2213/091	. Indication of kind/number of subscriber
H04Q 2213/092	. Scanning of (subscriber) lines, registers, translators
H04Q 2213/093	. Personal computer
H04Q 2213/094	. Range extender
H04Q 2213/095	. User access; PIN code
H04Q 2213/096	. Digital subscriber terminal
H04Q 2213/097	. Numbering
H04Q 2213/098	. Mobile subscriber
H04Q 2213/099	. Loop multiplexer (not ISDN BRI/PRI; not 381), e.g. loop splitter
H04Q 2213/10	. Register
H04Q 2213/101	. Discriminating selectors
H04Q 2213/102	. Common translator
H04Q 2213/103	. Memories
H04Q 2213/104	. Central control; Computer control
H04Q 2213/106	. Microcomputer; Microprocessor
H04Q 2213/107	. Control equipment for part of the connection
H04Q 2213/109	. Initialising; Downloading of parameters or program routines
H04Q 2213/11	. Sequence switches
H04Q 2213/12	. Call indicator, e.g. number indicator
H04Q 2213/121	. Marker
H04Q 2213/124	. Pulse distributor
H04Q 2213/13	. Charging
H04Q 2213/13001	. Step by step switches
H04Q 2213/13003	. Constructional details of switching devices
H04Q 2213/1301	. Optical transmission, optical switches

H04Q 2213/13012	. Hybrid fiber coax, HFC
H04Q 2213/13016	. Optical subcarrier modulation
H04Q 2213/1302	. Relay switches
H04Q 2213/1303	. Pulse amplitude modulation, PAM
H04Q 2213/13031	. Pulse code modulation, PCM
H04Q 2213/13034	. A/D conversion, code compression/expansion
H04Q 2213/13036	. Serial/parallel conversion, parallel bit transmission
H04Q 2213/13038	. Optical modulation
H04Q 2213/13039	. Asymmetrical two-way transmission, e.g. ADSL, HDSL
H04Q 2213/1304	. Coordinate switches, crossbar, 4/2 with relays, coupling field
H04Q 2213/13046	. Binary switch, ?-element
H04Q 2213/1305	. Software aspects
H04Q 2213/13051	. Software generation
H04Q 2213/13052	. Multitasking
H04Q 2213/13053	. Priority levels
H04Q 2213/13054	. Expert system
H04Q 2213/13056	. Routines, finite state machines
H04Q 2213/13057	. Object-oriented software
H04Q 2213/13058	. Interrupt request
H04Q 2213/1307	. Call setup
H04Q 2213/13072	. Sequence circuits for call signaling, ACD systems
H04Q 2213/13076	. Distributing frame, MDF, cross-connect switch
H04Q 2213/1308	. Power supply
H04Q 2213/13082	. Power supply via phantom line
H04Q 2213/1309	. Apparatus individually associated with a subscriber line, line circuits
H04Q 2213/13091	. CLI, identification of calling line
H04Q 2213/13092	. Scanning of subscriber lines, monitoring
H04Q 2213/13093	. Personal computer, PC
H04Q 2213/13094	. Range extender
H04Q 2213/13095	. PIN / Access code, authentication
H04Q 2213/13096	. Digital apparatus individually associated with a subscriber line, digital line circuits
H04Q 2213/13097	. Numbering, addressing
H04Q 2213/13098	. Mobile subscriber
H04Q 2213/13099	. Loop multiplexer
H04Q 2213/131	. Register
H04Q 2213/13102	. Common translator
H04Q 2213/13103	. Memory
H04Q 2213/13104	. Central control, computer control
H04Q 2213/13106	. Microprocessor, CPU
H04Q 2213/13107	. Control equipment for a part of the connection, distributed control, co-processing

- H04Q 2213/13109 . Initializing, personal profile
- H04Q 2213/13121 . Marker
- H04Q 2213/13124 . Pulse distributor
- H04Q 2213/1313 . Metering, billing
- H04Q 2213/13134 . Coin boxes, payphone, prepaid
- H04Q 2213/13136 . Collect call ([information service H04Q 2213/13376](#))
- H04Q 2213/13138 . Least cost routing, LCR
- H04Q 2213/13139 . Fraud detection/prevention
- H04Q 2213/13141 . Hunting for free outlet, circuit or channel
- H04Q 2213/13144 . Searching path through number of switching stages or nodes, e.g. revertive blocking
- H04Q 2213/13145 . Rerouting upon failure
- H04Q 2213/13146 . Rerouting upon blocking/overload, rearrangement
- H04Q 2213/13148 . Maximum profit routing
- H04Q 2213/13149 . Change of provider, e.g. network or service
- H04Q 2213/1315 . Call waiting
- H04Q 2213/13152 . Callback
- H04Q 2213/13156 . Automatic digit redialling, automatic call retry
- H04Q 2213/1316 . Service observation, testing
- H04Q 2213/13162 . Fault indication and localisation
- H04Q 2213/13163 . Fault alarm
- H04Q 2213/13164 . Traffic (registration, measurement,...)
- H04Q 2213/13166 . Fault prevention
- H04Q 2213/13167 . Redundant apparatus
- H04Q 2213/13168 . Error Correction
- H04Q 2213/13172 . Supervisory signals
- H04Q 2213/13173 . Busy signals
- H04Q 2213/13174 . Data transmission, file transfer
- H04Q 2213/13175 . Graphical user interface [GUI], WWW interface, visual indication
- H04Q 2213/13176 . Common channel signaling, CCS7
- H04Q 2213/13178 . Control signals
- H04Q 2213/13179 . Fax, still picture
- H04Q 2213/1318 . Ringing
- H04Q 2213/1319 . Amplifier, attenuation circuit, echo suppressor
- H04Q 2213/13191 . Repeater
- H04Q 2213/13194 . Four wire connection, transmission
- H04Q 2213/13196 . Connection circuit/link/trunk/junction, bridge, router, gateway
- H04Q 2213/13199 . Modem, modulation
- H04Q 2213/132 . Multiple-zone-metering
- H04Q 2213/13201 . Change-over of service during connection
- H04Q 2213/13202 . Network termination [NT]

- H04Q 2213/13203 . Exchange termination [ET
- H04Q 2213/13204 . Protocols
- H04Q 2213/13205 . Primary rate access, PRI
- H04Q 2213/13206 . User-to-user signaling, UUS
- H04Q 2213/13208 . Inverse multiplexing, channel bonding, e.g. TSSI aspects
- H04Q 2213/13209 . ISDN
- H04Q 2213/13213 . Counting, timing circuits
- H04Q 2213/13214 . Clock signals
- H04Q 2213/13215 . Code checking, CRC
- H04Q 2213/13216 . Code signals, frame structure
- H04Q 2213/13217 . Cranckback in routing, trombone connection, loopback circuit
- H04Q 2213/1322 . PBX
- H04Q 2213/13222 . PBX circuits in public exchange, centrex
- H04Q 2213/13224 . Off-net subscriber, dial in to/out from network, teleworking
- H04Q 2213/1323 . Party line
- H04Q 2213/1324 . Conference call
- H04Q 2213/13242 . Broadcast, diffusion, multicast, point-to-multipoint (1 : N)
- H04Q 2213/13246 . Instant speaker's algorithm [ISA]
- H04Q 2213/13248 . Multimedia
- H04Q 2213/1325 . Priority service
- H04Q 2213/13251 . Restricted service, class of service
- H04Q 2213/13256 . Call screening
- H04Q 2213/1326 . Consultation call, broker's call, call hold, toggling
- H04Q 2213/1327 . Release and resetting of connection
- H04Q 2213/13271 . Forced release
- H04Q 2213/13272 . Premature release
- H04Q 2213/13274 . Call rejection, call barring
- H04Q 2213/1328 . Call transfer, e.g. in PBX
- H04Q 2213/13281 . Call transfer/forward at night
- H04Q 2213/13282 . Call forward, follow-me, call diversion
- H04Q 2213/13284 . Call tracing
- H04Q 2213/13286 . Direct in-dialling in PBX, DDI
- H04Q 2213/13287 . Wake-up call service
- H04Q 2213/13288 . Closed user groups, CUG
- H04Q 2213/1329 . Asynchronous transfer mode, ATM
- H04Q 2213/13291 . Frequency division multiplexing, FDM
- H04Q 2213/13292 . Time division multiplexing, TDM
- H04Q 2213/13293 . TASI, irregular time division, burst switching
- H04Q 2213/13294 . CDMA, code division multiplexing, i.e. combinations of [H04Q 2213/13291](#) and/or [H04Q 2213/13292](#) with space division

- H04Q 2213/13295 . Wavelength multiplexing, WDM
- H04Q 2213/13296 . Packet switching, X.25, frame relay
- H04Q 2213/13297 . Coupling different rates in TDM systems, data rate adaptation
- H04Q 2213/13298 . Local loop systems, access network
- H04Q 2213/13299 . Bus
- H04Q 2213/133 . Multiple-time-metering
- H04Q 2213/13302 . Magnetic elements
- H04Q 2213/13305 . Transistors, semiconductors in general
- H04Q 2213/13306 . Ferro-electric elements
- H04Q 2213/1331 . Delay elements, shift registers
- H04Q 2213/1332 . Logic circuits
- H04Q 2213/13322 . Integrated circuits
- H04Q 2213/1333 . Random systems
- H04Q 2213/13331 . Abbreviated dialling
- H04Q 2213/13332 . Broadband, CATV, dynamic bandwidth allocation
- H04Q 2213/13333 . Earth satellites
- H04Q 2213/13334 . Key telephone systems
- H04Q 2213/13335 . Simulation, emulation
- H04Q 2213/13336 . Store & forward, messaging systems ([email H04Q 2213/13375](#))
- H04Q 2213/13337 . Picturephone, videotelephony
- H04Q 2213/13338 . Do-not-disturb
- H04Q 2213/13339 . Ciphering, encryption, security
- H04Q 2213/1334 . Configuration within the switch
- H04Q 2213/13341 . Connections within the switch
- H04Q 2213/13342 . Arrangement of switches in the network
- H04Q 2213/13343 . Neural networks
- H04Q 2213/13344 . Overflow
- H04Q 2213/13345 . Intelligent networks, SCP
- H04Q 2213/13348 . Channel/line reservation
- H04Q 2213/13349 . Network management
- H04Q 2213/13352 . Self-routing networks, real-time routing
- H04Q 2213/13353 . Routing table, map memory
- H04Q 2213/1336 . Synchronisation
- H04Q 2213/13361 . Synchronous systems
- H04Q 2213/13362 . Asynchronous systems
- H04Q 2213/13363 . Pulse stuffing, bit stuffing
- H04Q 2213/13367 . Hierarchical multiplexing, add-drop multiplexing
- H04Q 2213/1337 . Operator, emergency services
- H04Q 2213/13372 . Intercepting operator
- H04Q 2213/13374 . Paging

- H04Q 2213/13375 . Electronic mail
- H04Q 2213/13376 . Information service, downloading of information, 0800/0900 services
- H04Q 2213/13377 . Recorded announcement
- H04Q 2213/13378 . Speech recognition, speech analysis
- H04Q 2213/1338 . Inter-exchange connection
- H04Q 2213/13381 . Pair-gain system, digital loop carriers
- H04Q 2213/13383 . Hierarchy of switches, main and subexchange, e.g. satellite exchange
- H04Q 2213/13384 . Inter-PBX traffic, PBX networks, e.g. corporate networks
- H04Q 2213/13385 . Off-net subscriber
- H04Q 2213/13386 . Line concentrator
- H04Q 2213/13387 . Call gapping
- H04Q 2213/13388 . Saturation signaling systems
- H04Q 2213/13389 . LAN, internet
- H04Q 2213/1339 . Fixed association of channels
- H04Q 2213/13391 . Channel assigned to connections
- H04Q 2213/13392 . Channels assigned according to rules
- H04Q 2213/13393 . Time slot switching, T-stage, time slot interchanging, TSI
- H04Q 2213/13395 . Permanent channel, leased line
- H04Q 2213/13396 . Signaling in general, in-band signalling
- H04Q 2213/13399 . Virtual channel/circuits
- H04Q 2213/134 . Coin box
- H04Q 2213/13402 . Data transmission out of voice frequency band ([ADSL H04Q 2213/13039](#))
- H04Q 2213/13405 . Dual frequency signaling, DTMF
- H04Q 2213/13407 . Detection of data transmission mode
- H04Q 2213/135 . Service creation
- H04Q 2213/13501 . Feature interactions
- H04Q 2213/13502 . primitives - inc. service-independent building blocks [SIBBs]
- H04Q 2213/13503 . object-oriented systems
- H04Q 2213/13504 . client/server architectures
- H04Q 2213/13505 . management information base [MIB]
- H04Q 2213/13511 . reservation
- H04Q 2213/13512 . 800 - freefone
- H04Q 2213/13513 . UPT - personal as opposed to terminal mobility, inc. number portability
- H04Q 2213/13514 . quality of service - inc. grade of service
- H04Q 2213/13515 . authentication, authorisation - fraud prevention
- H04Q 2213/13516 . agents or brokers - user, terminal etc., also OSI agent/managers
- H04Q 2213/13517 . SLEE - service logic execution
- H04Q 2213/13521 . fault management
- H04Q 2213/13522 . traffic management
- H04Q 2213/13523 . bandwidth management, e.g. capacity management

- H04Q 2213/13524 . cost management ([least cost H04Q 2213/13138](#))
- H04Q 2213/13525 . GUI - graphical user interface, inc. for service creation
- H04Q 2213/13526 . resource management
- H04Q 2213/13527 . protocols - X.25, TCAP etc.
- H04Q 2213/13528 . SCP architecture
- H04Q 2213/13531 . virtual networks - inc. PVN
- H04Q 2213/13532 . mobile networks
- H04Q 2213/13533 . multivendor and hybrid, e.g. public/private, networks, inc. international
- H04Q 2213/13534 . Internet - WWW, HTML, browsers etc.
- H04Q 2213/13535 . distributed systems - also domains in service creation
- H04Q 2213/13541 . routing
- H04Q 2213/13542 . numbering plans, e.g. number re-allocation
- H04Q 2213/13543 . network planning, configuration management, e.g. for growth
- H04Q 2213/13544 . modeling or simulation, particularly of networks
- H04Q 2213/13545 . monitoring of signaling messages, intelligent network
- H04Q 2213/13546 . Intelligent Peripheral
- H04Q 2213/13547 . subscriber, e.g. profile, database, database access
- H04Q 2213/13548 . call modeling, e.g. Basic Call State Model
- H04Q 2213/13561 . congestion - inc. overflow
- H04Q 2213/13562 . blocking
- H04Q 2213/13563 . call gapping, e.g. to prevent congestion
- H04Q 2213/13564 . load balancing
- H04Q 2213/13565 . restoration, e.g. disaster recovery, self-healing networks
- H04Q 2213/13566 . mediation
- H04Q 2213/13567 . negotiation, management policy, goals
- H04Q 2213/136 . Collect call, e.g. 800 service
- H04Q 2213/138 . Least cost routing
- H04Q 2213/14 . Busy test, e.g. marking busy
- H04Q 2213/141 . Hunting for free outlet, circuit, channel
- H04Q 2213/144 . Searching a free path through cascaded switching stages
- H04Q 2213/145 . Rerouting, e.g. on failure
- H04Q 2213/146 . Rearrangement
- H04Q 2213/15 . Waiting
- H04Q 2213/152 . Automatic call retry
- H04Q 2213/156 . Automatic redialling
- H04Q 2213/16 . Service observation; Fault circuit; Testing
- H04Q 2213/161 . Blocking or cutoff of faulty apparatus, e.g. timed out
- H04Q 2213/162 . Fault indication, e.g. localisation
- H04Q 2213/163 . Fault alarm
- H04Q 2213/164 . Traffic registration; Adaptation of traffic possibilities

H04Q 2213/166	. Prevention of faults
H04Q 2213/167	. Redundancy
H04Q 2213/171	. Number indicating signals (no dial signals)
H04Q 2213/172	. Supervisory signals
H04Q 2213/173	. Busy signal
H04Q 2213/174	. Data transmission
H04Q 2213/175	. Other signals
H04Q 2213/176	. Common channel signalling
H04Q 2213/177	. Number sending signals, e.g. dialling tone, proceed to send
H04Q 2213/178	. Control signals, e.g. also service connection
H04Q 2213/179	. Facsimile; Fax, e.g. still picture
H04Q 2213/18	. Ringing
H04Q 2213/182	. Ring trip
H04Q 2213/19	. Echo-cancelling; Hybrid; Amplifier; Attenuator
H04Q 2213/191	. Repeater
H04Q 2213/192	. Common amplifier for bidirectional traffic
H04Q 2213/194	. Four-wire connection or transmission
H04Q 2213/196	. Connection-circuit; Trunk; Junction circuit
H04Q 2213/197	. Ping-pong transmission
H04Q 2213/198	. Temporary associated devices; Pooled adapters
H04Q 2213/199	. Modem
H04Q 2213/20	. ISDN
H04Q 2213/201	. Change-over service
H04Q 2213/202	. Network termination (NT)
H04Q 2213/203	. Exchange termination (ET)
H04Q 2213/204	. ISDN protocol; ISO 7
H04Q 2213/205	. Primary rate access
H04Q 2213/206	. User-to-user signalling
H04Q 2213/208	. Inverse multiplexing; Time slot sequence integrity (TSSI) aspects
H04Q 2213/21	. Impulse transmission
H04Q 2213/211	. Impulse correction or reshaping
H04Q 2213/212	. Absorbing of digits
H04Q 2213/214	. Phase shifted impulses; Clock signals; Timing
H04Q 2213/215	. Code checking
H04Q 2213/216	. Code signals; Framing (not synchronizing)
H04Q 2213/217	. Setting of switch by means of pulses
H04Q 2213/218	. Bistable relays, e.g. Ferreed
H04Q 2213/22	. PBX
H04Q 2213/222	. PBX circuits in public exchange (Centrex)
H04Q 2213/23	. Partyline

H04Q 2213/24	. Conference circuit
H04Q 2213/242	. Broadcast and multicast (1:N)
H04Q 2213/243	. Con-cast, e.g. multipoint-point (N:1)
H04Q 2213/246	. Instant speaker's algorithm (ISA)
H04Q 2213/25	. Preferential service
H04Q 2213/251	. Restricted service
H04Q 2213/252	. Breaking-in on existing connection
H04Q 2213/256	. Call screening
H04Q 2213/26	. Call-back
H04Q 2213/27	. Release
H04Q 2213/271	. Forced release
H04Q 2213/272	. Premature release
H04Q 2213/274	. Call rejection
H04Q 2213/28	. Call transfer
H04Q 2213/281	. Prepared call transfer, e.g. night service, intercepting service
H04Q 2213/282	. Call forwarding
H04Q 2213/284	. Call tracing
H04Q 2213/286	. Direct inward dialling (PBX)
H04Q 2213/287	. Call service, e.g. morning call service
H04Q 2213/29	. ATM
H04Q 2213/291	. Frequency division multiplex
H04Q 2213/292	. Time (de)multiplexing
H04Q 2213/293	. Irregular time switching , e.g. TASI; Burst switching
H04Q 2213/294	. Other multiplexing systems, e.g. codemultiplex, TDM, FDM, FDM and Space division, TDM and Space division
H04Q 2213/295	. Wavelength division multiplex
H04Q 2213/296	. Packet switching
H04Q 2213/297	. Coupling circuits between different (rate) TDM systems
H04Q 2213/298	. Loop or ring system
H04Q 2213/299	. Bus
H04Q 2213/301	. Tubes and other non-linear elements with 2 electrodes, e.g. diodes
H04Q 2213/302	. Magnetic elements
H04Q 2213/303	. Tubes and other non-linear elements with more than two electrodes
H04Q 2213/304	. Supra-conductors; thermistors; varistors
H04Q 2213/305	. Transistors
H04Q 2213/306	. Ferro-electric elements
H04Q 2213/307	. Hall elements
H04Q 2213/308	. Photo conductors; Photo elements
H04Q 2213/31	. Delay devices; Circuits, e.g. shift memories
H04Q 2213/32	. Logic elements

H04Q 2213/322	. Integrated circuit
H04Q 2213/33	. Special systems; Special service
H04Q 2213/331	. Abbreviated dialing
H04Q 2213/332	. Broadband system
H04Q 2213/333	. Systems with earth-satellites
H04Q 2213/334	. Key telephone system
H04Q 2213/335	. Simulation
H04Q 2213/336	. Store and forward, e.g. message switching
H04Q 2213/337	. Picturephone
H04Q 2213/338	. Do not disturb
H04Q 2213/339	. Cipherring/encryption
H04Q 2213/34	. General scheme; Position of components in an exchange
H04Q 2213/341	. Contactbank connections
H04Q 2213/342	. General scheme; Position of exchanges
H04Q 2213/343	. Neural network
H04Q 2213/344	. Overflow
H04Q 2213/345	. Intelligent network
H04Q 2213/346	. Switch with inverted grouping
H04Q 2213/347	. Nodal network
H04Q 2213/348	. Reservation of lines/channels
H04Q 2213/349	. Network management; Expert system
H04Q 2213/35	. Separate control and speech paths, e.g. route-searching planes
H04Q 2213/352	. Self-routing switch
H04Q 2213/353	. Map memory
H04Q 2213/36	. Synchronisation
H04Q 2213/361	. Synchronous system
H04Q 2213/362	. Asynchronous system
H04Q 2213/363	. Bit or pulse stuffing
H04Q 2213/366	. Integrated systems, e.g. transparency
H04Q 2213/367	. Multiple multiplexing; Hierarchical multiplexing
H04Q 2213/37	. Operator
H04Q 2213/372	. Intervention by operator; Intercepting operator
H04Q 2213/374	. Paging
H04Q 2213/375	. Electronic mail
H04Q 2213/376	. Information service
H04Q 2213/377	. Recorded announcement
H04Q 2213/378	. Speech recognition; Speech analysis
H04Q 2213/38	. Interexchange connections, e.g. connections of different kinds of networks
H04Q 2213/381	. Pair gain system
H04Q 2213/382	. Provisions for interexchange traffic in the local exchange

- H04Q 2213/383 . Main and subexchange, e.g. satellite exchanges
- H04Q 2213/384 . Inter-PBX traffic; PBX networks
- H04Q 2213/385 . Traffic in PBX to and from public exchange
- H04Q 2213/386 . Line concentrator
- H04Q 2213/388 . Saturation signalling system
- H04Q 2213/39 . Channels assigned to subscribers
- H04Q 2213/391 . Channel allocation to connections
- H04Q 2213/392 . Channel allocation - special rules
- H04Q 2213/393 . Channel interchanging, e.g. time slot switching
- H04Q 2213/394 . Channel assignment without time slot switching
- H04Q 2213/395 . (Semi)permanent channels, e.g. leased lines
- H04Q 2213/396 . Signalling in general; Special register channel
- H04Q 2213/399 . Virtual channel allocation
- H04Q 2213/401 . DC and voltages of different kinds or values
- H04Q 2213/402 . AC outside voice band
- H04Q 2213/403 . Voice frequency
- H04Q 2213/405 . Voice frequency current used for digit selection
- H04Q 2213/407 . Push-button dialling (not T04Q13/405)