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.
Electrical details

signalling currents (multiplex systems providing for calling or supervisory signals \( H04J \, 1/14 \); telephone substation equipment \( H04Q \, 3/12 \); telephone substation equipment \( H04M \, 1/00 \)

using trains of dc pulses (\( H04Q \, 1/39 \) takes precedence)

Impulse regenerators with mechanical or other non-electrical marking arrangements

Pulse-correcting arrangements, e.g. for reducing effects due to interference

using combinations of direct currents of different amplitudes or polarities over line conductors or combination of line conductors

using coded pulse groups

whereby duration of pulse or interval between two pulses is variable

involving the position of a pulse in a cycle

using alternate current (\( H04Q \, 1/50 \) takes precedence)

with out-of-voice band signalling frequencies

\{ using one signalling frequency \}

\{ using two or more signalling frequencies, transmitted in succession or simultaneously \}

with voice-band signalling frequencies

using one signalling frequency (\( H04Q \, 1/46 \) takes precedence)

\{ the same frequency being used for all signalling information, e.g. A.C. nr.9 system \}

with conversion of a single frequency signal into a digital signal

\{ which is transmitted in digital form \}

using multi-frequency signalling (\( H04Q \, 1/46 \) takes precedence)

in which m-out-of-n signalling frequencies are transmitted

\{ with an additional signal transmitted for voice protection \}

with conversion of multifrequency signals into digital signals

\{ which are transmitted in digital form \}

comprising means for distinguishing between a signalling current of predetermined frequency and a complex current containing that frequency, e.g. speech current

Induced-current signalling arrangements

Conversion between different kinds of signals

Amplifier switched-on automatically in dependence on automatically-selected lines

Balancing circuitry switched-on automatically in dependence on automatically-selected lines

Selecting arrangements (\( H04Q \, 5/00 \) - \( H04Q \, 11/00 \) take precedence)

using crossbar selectors in the switching stages

using relay selectors in the switching stages

in which the relays are arranged in a matrix configuration

\{ Arrangements providing connection between exchanges \}

\{ Details \}

\{ Provisions for signalling (circuitry in \( H04Q \, 1/30 \) \}

\{ Provisions for intelligent networking \}

\{ customer-controlled \}

\{ involving call modelling techniques, e.g. modifications to the basic call state model \[BCSM\] \}

\{ involving techniques for avoiding interaction of call service features \}

\{ involving hybrid, i.e. a mixture of public and private, or multi-vendor systems \}

\{ Personal communications services, e.g. provisions for portability of subscriber numbers (subscriber services provided at exchanges \( H04M \, 3/42) \}

\{ Service creation techniques \}

\{ using service-independent building blocks (SIBBs) or "primitives" \}

\{ Provisions for network management \}

\{ Bandwidth allocation or management \}

\{ customer-controlled \}

\{ Fault management techniques \}

\{ involving restoration of networks, e.g. disaster recovery, self-healing networks \}

\{ Network planning or design; Modelling of planned or existing networks \}

\{ Network testing or monitoring arrangements \}

\{ Congestion or overload control \}

\{ Specification, development or application of network management software, e.g. software re-use \}

\{ Circuit arrangements for selectors responsive to a permutation code \}

\{ Circuit arrangements for receivers of routing digits \}

\{ for group or trunk group selectors \}

\{ for local or long-distance selectors \}

\{ for PBX selectors, i.e. private branch exchange selectors \}

\{ for line selectors providing transfer of routing digits \}

\{ for two-way operation selectors \}

\{ for marking-switches \}

\{ Circuit arrangements for first stage of hunting switching \}

\{ for preselectors \}

\{ comprising common calling and disconnecting circuit \}

\{ for line finders \}

\{ comprising common calling and disconnecting circuit \}
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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]
{ Network aspects }

{ Details }

{ Signalling aspects }

{ Operation or maintenance aspects }

{ Network resource allocation, dimensioning or optimisation }

{ Quality of service aspects }

{ Provisions for optical burst or packet control aspects }

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

2213/001 . Motorselectors
2213/002 . Graphical representation
2213/003 . Constructional details
2213/011 . Periodic optical structures, e.g. gratings, holograms
2213/012 . Tunable optical systems
2213/013 . Optical shutters, e.g. LCD arrays
2213/014 . Optical storage, not delay lines
2213/015 . 3D-optical arrangement
2213/016 . Optical subcarrier modulation
2213/017 . Optical polarisation
2213/02 . Relay switches
2213/03 . PAM
2213/031 . PCM
2213/032 . Delta modulation
2213/033 . Other modulation methods
2213/034 . Codec; PCM compression
2213/036 . Series parallel conversion; Parallel bit transmission
2213/037 . Resonant transfer; Sample and hold
2213/038 . Optical modulation
2213/04 . Coordinate switches; Crossbar switches
2213/042 . Elements placed in matrix relation, not serving as connection switch
2213/046 . Binary switch (Beta element)
2213/05 . Software aspects
2213/052 . Multi-tasking
2213/053 . Priority levels
2213/054 . Expert systems, e.g. neural networks
2213/055 . Linked lists
2213/056 . Software routines, e.g. finite state machines
2213/058 . IRQ
2213/061 . Preselector; Second line switch
2213/062 . Finder switch (e.g. line finder, call finder)
2213/063 . Strowger-switch as finder switch
2213/064 . Cascaded finder or preselector switches
2213/065 . Group selector
2213/066 . Switch with two or more wipersets
2213/067 . Finder switch serving as final selector
2213/068 . Final selector
2213/069 . Panel switches
2213/07 . Call distribution; Call detection; Call signalling by common apparatus
2213/072 . Sequence circuits
2213/076 . Distributing frame; Cross connect
2213/08 . Power supply
2213/082 . Phantom circuits
2213/09 . Subscriber related equipment; Analog terminal
2213/091 . Indication of kind/number of subscriber
2213/092 . Scanning of (subscriber) lines, registers, translators
2213/093 . Personal computer
2213/094 . Range extender
2213/095 . User access; PIN code
2213/096 . Digital subscriber terminal
2213/097 . Numbering
2213/098 . Mobile subscriber
2213/099 . Loop multiplexer (not ISDN BRI/PRI; not 381), e.g. loop splitter
2213/10 . Register
2213/101 . Discriminating selectors
2213/102 . Common translator
2213/103 . Memories
2213/104 . Central control; Computer control
2213/106 . Microcomputer; Microprocessor
2213/107 . Control equipment for part of the connection
2213/109 . Initialising; Downloading of parameters or program routines
2213/11 . Sequence switches
2213/12 . Call indicator, e.g. number indicator
2213/121 . Marker
2213/124 . Pulse distributor
2213/13 . Charging
2213/13001 . Step by step switches
2213/13003 . Constructional details of switching devices
2213/1301 . Optical transmission, optical switches
2213/13012 . Hybrid fiber coax, HFC
2213/13016 . Optical subcarrier modulation
2213/1302 . Relay switches
2213/1303 . Pulse amplitude modulation, PAM
2213/13031 . Pulse code modulation, PCM
2213/13034 . A/D conversion, code compression/expansion
2213/13036 . Serial/parallel conversion, parallel bit transmission
2213/13038 . Optical modulation
2213/13039 . Asymmetrical two-way transmission, e.g. ADSL, HDSL
2213/1304 . Coordinate switches, crossbar, 4/2 with relays, coupling field
2213/13046 . Binary switch, β-element
2213/1305 . Software aspects
2213/13051 . Software generation
2213/13052 . Multitasking
2213/13053 . Priority levels
2213/13054 . Expert system
2213/13056 . Routines, finite state machines
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 . CLL 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. reversion 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]
2213/1334 . Key telephone systems
2213/1335 . Simulation, emulation
2213/1336 . Store & forward, messaging systems (email
  H04Q 2213/13375)
2213/1337 . Picturephone, videotelephony
2213/1338 . Do-not-disturb
2213/1339 . Ciphering, encryption, security
2213/1334 . Configuration within the switch
2213/1341 . Connections within the switch
2213/1342 . Arrangement of switches in the network
2213/1343 . Neural networks
2213/1344 . Overlay
2213/1345 . Intelligent networks, SCP
2213/1348 . Channel/line reservation
2213/1349 . Network management
2213/1352 . Self-routing networks, real-time routing
2213/1353 . Routing table, map memory
2213/1336 . Synchronisation
2213/1361 . Synchronous systems
2213/1362 . Asynchronous systems
2213/1363 . Pulse stuffing, bit stuffing
2213/1367 . Hierarchical multiplexing, add-drop multiplexing
2213/1337 . Operator, emergency services
2213/1372 . Interception
2213/1374 . Paging
2213/1375 . Electronic mail
2213/1376 . Information service, downloading of information,
  0800/0900 services
2213/1377 . Recorded announcement
2213/1378 . Speech recognition, speech analysis
2213/1338 . Inter-exchange connection
2213/1381 . Pair-gain system, digital loop carriers
2213/1383 . Hierarchy of switches, main and subexchange, e.g.
  satellite exchange
2213/1384 . Inter-PBX traffic, PBX networks, e.g. corporate
  networks
2213/1385 . Off-net subscriber
2213/1386 . Line concentrator
2213/1387 . Call gapping
2213/1388 . Saturation signaling systems
2213/1389 . LAN, internet
2213/1339 . Fixed association of channels
2213/1391 . Channel assigned to connections
2213/1392 . Channels assigned according to rules
2213/1393 . Time slot switching, T-stage, time slot
  interchanging, TSI
2213/1395 . Permanent channel, leased line
2213/1396 . Signaling in general, in-band signalling
2213/1399 . 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 - freephone
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
ATM
Call service, e.g. morning call service
Call tracing
Call forwarding
Call rejection
Premature release
Forced release
Call screening
Breaking-in on existing connection
Restricted service
User-to-user signalling
Connection-circuit; Trunk; Junction circuit
Network termination [NT]
Exchange termination [ET]
ISDN protocol; ISO 7
Primary rate access
ISDN
Modem
Temporary associated devices; Pooled adapters
ISDN
Packet switching
Coupling circuits between different (rate) TDM systems
Loop or ring system
Bus
Tubes and other non-linear elements with 2 electrodes, e.g. diodes
Magnetic elements
Tubes and other non-linear elements with more than two electrodes
Superconductors; Thermistors; Varistors
Transistors
Ferro-electric elements
Hall elements
Photo conductors; Photo elements
Delay devices; Circuits, e.g. shift memories
Logic elements
Integrated circuit
Special systems; Special service
Abbreviated dialing
Broadband system
Systems with earth-satellites
Key telephone system
Simulation
Store and forward, e.g. message switching
Picturephone
Do not disturb
Ciphering/encryption
General scheme; Position of components in an exchange
Contactbank connections
General scheme; Position of exchanges
Neural network
Overflow
Intelligent network
Switch with inverted grouping
Nodal network
Reservation of lines/channels
Network management; Expert system
Separate control and speech paths, e.g. route-searching planes
Self-routing switch
Map memory
Synchronisation
Synchronous system
Asynchronous system
Bit or pulse stuffing
Integrated systems, e.g. transparency
Multiple multiplexing; Hierarchical multiplexing
Operator
Intervention by operator; Intercepting operator
Paging
Electronic mail
Information service
Recorded announcement
Speech recognition; Speech analysis
Interexchange connections, e.g. connections of different kinds of networks
Pair gain system
Provisions for interexchange traffic in the local exchange
Main and subexchange, e.g. satellite exchanges
Inter-PBX traffic; PBX networks
Traffic in PBX to and from public exchange
Line concentrator
Saturation signalling system
Channels assigned to subscribers
Channel allocation to connections
Channel allocation - special rules
Channel interchanging, e.g. time slot switching
Channel assignment without time slot switching
(Semi)permanent channels, e.g. leased lines
Signalling in general; Special register channel
Virtual channel allocation
DC and voltages of different kinds or values
AC outside voice band
Voice frequency
Voice frequency current used for digit selection
Push-button dialling (not H04Q 2213/405)