

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H04 ELECTRIC COMMUNICATION TECHNIQUE

(NOTE omitted)

## H04W WIRELESS COMMUNICATION NETWORKS (broadcast communication [H04H](#); communication systems using wireless links for non-selective communication, e.g. wireless extensions [H04M 1/72](#))

### NOTES

1. This subclass covers :
  - communication networks for selectively establishing one or a plurality of wireless communication links between a desired number of users or between users and network equipment, for the purpose of transferring information via these wireless communication links;
  - networks deploying an infrastructure for mobility management of wireless users connected thereto, e.g. cellular networks, WLAN [Wireless Local Area Network], wireless access networks, e.g. WLL [Wireless Local Loop] or self-organising wireless communication networks, e.g. ad hoc networks;
  - planning or deployment specially adapted for the above-mentioned wireless networks;
  - services or facilities specially adapted for the above-mentioned wireless networks;
  - arrangements or techniques specially adapted for the operation of the above-mentioned wireless networks.
2. This subclass does not cover :
  - communication systems using wireless extensions, i.e. wireless links without selective communication, e.g. cordless telephones, which are covered by group [H04M 1/72](#);
  - broadcast communication, which is covered by subclass [H04H](#).

### WARNINGS

1. 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.
2. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
 

<a href="#">H04W 28/082</a>	covered by	<a href="#">H04W 28/085</a>
<a href="#">H04W 28/084</a>	covered by	<a href="#">H04W 28/08</a>
<a href="#">H04W 28/086</a>	covered by	<a href="#">H04W 28/0804</a>
<a href="#">H04W 28/088</a>	covered by	<a href="#">H04W 28/0842</a>

<b>4/00</b>	<b>Services specially adapted for wireless communication networks; Facilities therefor</b>	4/027	. . . {using movement velocity, acceleration information}
	<b>NOTES</b>	4/029	. . Location-based management or tracking services
	1. This group covers mobile application services or application service signalling for communication over wireless networks.	4/06	. Selective distribution of broadcast services, e.g. multimedia broadcast multicast service [MBMS]; Services to user groups; One-way selective calling services
	2. This group focuses on application services specially adapted for wireless networks or adjusted to the wireless environment.	4/08	. . User group management
		4/10	. . Push-to-Talk [PTT] or Push-On-Call services
		4/12	. Messaging; Mailboxes; Announcements
4/02	. Services making use of location information	4/14	. . Short messaging services, e.g. short message services [SMS] or unstructured supplementary service data [USSD]
4/021	. . Services related to particular areas, e.g. point of interest [POI] services, venue services or geofences	4/16	. Communication-related supplementary services, e.g. call-transfer or call-hold
4/022	. . . {with dynamic range variability}	4/18	. Information format or content conversion, e.g. adaptation by the network of the transmitted or received information for the purpose of wireless delivery to users or terminals
4/023	. . {using mutual or relative location information between multiple location based services [LBS] targets or of distance thresholds}	4/185	. . {by embedding added-value information into content, e.g. geo-tagging}
4/024	. . Guidance services	4/20	. Services signaling; Auxiliary data signalling, i.e. transmitting data via a non-traffic channel
4/025	. . {using location based information parameters}		
4/026	. . . {using orientation information, e.g. compass}		

4/203	. . {for converged personal network application service interworking, e.g. OMA converged personal network services [CPNS]}	8/205	. . . {Transfer to or from user equipment or user record carrier}
4/21	. . for social networking applications	8/22	. Processing or transfer of terminal data, e.g. status or physical capabilities
4/23	. . for mobile advertising	8/24	. . Transfer of terminal data
4/24	. Accounting or billing	8/245	. . . {from a network towards a terminal}
4/30	. Services specially adapted for particular environments, situations or purposes	8/26	. Network addressing or numbering for mobility support
4/33	. . for indoor environments, e.g. buildings	8/265	. . {for initial activation of new user}
4/35	. . for the management of goods or merchandise	8/28	. . Number portability (; Network address portability)
4/38	. . for collecting sensor information	8/30	. Network data restoration; {Network data reliability; Network data fault tolerance}
4/40	. . for vehicles, e.g. vehicle-to-pedestrians [V2P]		
4/42	. . . for mass transport vehicles, e.g. buses, trains or aircraft	<b>12/00</b>	<b>Security arrangements; Authentication; Protecting privacy or anonymity</b>
4/44	. . . for communication between vehicles and infrastructures, e.g. vehicle-to-cloud [V2C] or vehicle-to-home [V2H]	12/009	. {specially adapted for networks, e.g. wireless sensor networks, ad-hoc networks, RFID networks or cloud networks}
4/46	. . . for vehicle-to-vehicle communication [V2V]	12/02	. Protecting privacy or anonymity, e.g. protecting personally identifiable information [PII]
4/48	. . . for in-vehicle communication	12/03	. Protecting confidentiality, e.g. by encryption
4/50	. Service provisioning or reconfiguring	12/033	. . of the user plane, e.g. user's traffic
4/60	. Subscription-based services using application servers or record carriers, e.g. SIM application toolkits	12/037	. . of the control plane, e.g. signalling traffic
4/70	. Services for machine-to-machine communication [M2M] or machine type communication [MTC]	12/04	. Key management, e.g. using generic bootstrapping architecture [GBA]
4/80	. Services using short range communication, e.g. near-field communication [NFC], radio-frequency identification [RFID] or low energy communication	12/041	. . Key generation or derivation
4/90	. Services for handling of emergency or hazardous situations, e.g. earthquake and tsunami warning systems [ETWS]	12/043	. . using a trusted network node as an anchor
<b>8/00</b>	<b>Network data management</b>	12/0431	. . . Key distribution or pre-distribution; Key agreement
8/005	. {Discovery of network devices, e.g. terminals}	12/0433	. . . Key management protocols
8/02	. Processing of mobility data, e.g. registration information at HLR [Home Location Register] or VLR [Visitor Location Register]; Transfer of mobility data, e.g. between HLR, VLR or external networks	12/047	. . without using a trusted network node as an anchor
8/04	. . Registration at HLR or HSS [Home Subscriber Server]	12/0471	. . . Key exchange
8/06	. . Registration at serving network Location Register, VLR or user mobility server	12/06	. Authentication
8/065	. . . {involving selection of the user mobility server}	12/062	. . Pre-authentication
8/08	. . Mobility data transfer	12/065	. . Continuous authentication
8/082	. . . {for traffic bypassing of mobility servers, e.g. location registers, home PLMNs or home agents}	12/068	. . {using credential vaults, e.g. password manager applications or one time password [OTP] applications}
8/085	. . . {involving hierarchical organized mobility servers, e.g. hierarchical mobile IP [HMIP]}	12/069	. . using certificates or pre-shared keys
8/087	. . . {for preserving data network PoA address despite hand-offs}	12/08	. Access security
8/10	. . . between location register and external networks	12/082	. . using revocation of authorisation
8/12	. . . between location registers or mobility servers	12/084	. . using delegated authorisation, e.g. open authorisation [OAuth] protocol
8/14	. . . between corresponding nodes	12/086	. . using security domains
8/16	. . . selectively restricting mobility {data} tracking	12/088	. . using filters or firewalls
8/18	. Processing of user or subscriber data, e.g. subscribed services, user preferences or user profiles; Transfer of user or subscriber data	12/10	. Integrity
8/183	. . {Processing at user equipment or user record carrier}	12/102	. . Route integrity, e.g. using trusted paths
8/186	. . {Processing of subscriber group data}	12/104	. . Location integrity, e.g. secure geotagging
8/20	. . Transfer of user or subscriber data	12/106	. . Packet or message integrity
		12/108	. . Source integrity
		12/12	. Detection or prevention of fraud
		12/121	. . Wireless intrusion detection systems [WIDS]; Wireless intrusion prevention systems [WIPS]
		12/122	. . . Counter-measures against attacks; Protection against rogue devices
		12/125	. . Protection against power exhaustion attacks
		12/126	. . Anti-theft arrangements, e.g. protection against subscriber identity module [SIM] cloning
		12/128	. . Anti-malware arrangements, e.g. protection against SMS fraud or mobile malware
		12/30	. Security of mobile devices; Security of mobile applications

12/33	. . using wearable devices, e.g. using a smartwatch or smart-glasses	16/32	. . Hierarchical cell structures
12/35	. . {Protecting application or service provisioning, e.g. securing SIM application provisioning}	<b>24/00</b>	<b>Supervisory, monitoring or testing arrangements</b>
12/37	. . Managing security policies for mobile devices or for controlling mobile applications	24/02	. Arrangements for optimising operational condition
12/40	. Security arrangements using identity modules	24/04	. Arrangements for maintaining operational condition
12/42	. . using virtual identity modules	24/06	. Testing, {supervising or monitoring} using simulated traffic
12/43	. . using shared identity modules, e.g. SIM sharing	24/08	. Testing, {supervising or monitoring} using real traffic
12/45	. . using multiple identity modules	24/10	. Scheduling measurement reports {; Arrangements for measurement reports}
12/47	. . using near field communication [NFC] or radio frequency identification [RFID] modules	<b>28/00</b>	<b>Network traffic or resource management</b>
12/48	. . using secure binding, e.g. securely binding identity modules to devices, services or applications	28/02	. Traffic management, e.g. flow control or congestion control
12/50	. Secure pairing of devices	28/0205	. . {at the air interface (dynamic wireless traffic scheduling <a href="#">H04W 72/12</a> )}
12/55	. . involving three or more devices, e.g. group pairing	28/021	. . {in wireless networks with changing topologies, e.g. ad-hoc networks (self-organizing networks <a href="#">H04W 84/18</a> )}
12/60	. Context-dependent security	28/0215	. . {based on user or device properties, e.g. MTC-capable devices (services for machine-to-machine communication [M2M] or machine type communication [MTC] <a href="#">H04W 4/70</a> ; wireless resource selection or allocation plan definition based on terminal or device properties <a href="#">H04W 72/51</a> )}
12/61	. . Time-dependent	28/0221	. . . {power availability or consumption}
12/63	. . Location-dependent; Proximity-dependent	28/0226	. . {based on location or mobility (handoff or reselection <a href="#">H04W 36/00</a> ; mobile application services making use of the location of users or terminals <a href="#">H04W 4/02</a> )}
12/64	. . . using geofenced areas	28/0231	. . {based on communication conditions (dynamic wireless traffic scheduling definition based on channel quality criteria <a href="#">H04W 72/54</a> )}
12/65	. . Environment-dependent, e.g. using captured environmental data	28/0236	. . . {radio quality, e.g. interference, losses or delay}
12/66	. . {Trust-dependent, e.g. using trust scores or trust relationships}	28/0242	. . . {Determining whether packet losses are due to overload or to deterioration of radio communication conditions}
12/67	. . Risk-dependent, e.g. selecting a security level depending on risk profiles	28/0247	. . {based on conditions of the access network or the infrastructure network (central resource management <a href="#">H04W 28/16</a> )}
12/68	. . Gesture-dependent or behaviour-dependent	28/0252	. . {per individual bearer or channel (dynamic wireless traffic scheduling <a href="#">H04W 72/12</a> )}
12/69	. . Identity-dependent	28/0257	. . . {the individual bearer or channel having a maximum bit rate or a bit rate guarantee}
12/71	. . . Hardware identity	28/0263	. . . {involving mapping traffic to individual bearers or channels, e.g. traffic flow template [TFT]}
12/72	. . . Subscriber identity	28/0268	. . {using specific QoS parameters for wireless networks, e.g. QoS class identifier [QCI] or guaranteed bit rate [GBR] (negotiating SLA or negotiating QoS <a href="#">H04W 28/24</a> )}
12/73	. . . Access point logical identity	28/0273	. . {adapting protocols for flow control or congestion control to wireless environment, e.g. adapting transmission control protocol [TCP] (wireless network protocols or protocol adaptations to wireless operation, e.g. wireless application protocol <a href="#">H04W 80/00</a> )}
12/75	. . . Temporary identity	28/0278	. . {using buffer status reports (dynamic wireless traffic scheduling definition <a href="#">H04W 72/12</a> )}
12/76	. . . Group identity	28/0284	. . {detecting congestion or overload during communication (monitoring arrangements <a href="#">H04L 43/00</a> )}
12/77	. . . Graphical identity		
12/79	. . . Radio fingerprint		
12/80	. Arrangements enabling lawful interception [LI]		
<b>16/00</b>	<b>Network planning, e.g. coverage or traffic planning tools; Network deployment, e.g. resource partitioning or cells structures</b>		
16/02	. Resource partitioning among network components, e.g. reuse partitioning		
16/04	. . Traffic adaptive resource partitioning		
16/06	. . Hybrid resource partitioning, e.g. channel borrowing		
16/08	. . . Load shedding arrangements		
16/10	. . Dynamic resource partitioning		
16/12	. . Fixed resource partitioning		
16/14	. Spectrum sharing arrangements {between different networks}		
16/16	. . for PBS [Private Base Station] arrangements		
16/18	. Network planning tools		
16/20	. . for indoor coverage or short range network deployment		
16/22	. Traffic simulation tools or models		
16/225	. . {for indoor or short range network}		
16/24	. Cell structures		
16/26	. . Cell enhancers {or enhancement}, e.g. for tunnels, building shadow		
16/28	. . using beam steering		
16/30	. . Special cell shapes, e.g. doughnuts or ring cells		

- 28/0289 . . {Congestion control (performing reselection for handling the traffic [H04W 36/22](#); load shedding arrangements in network planning [H04W 16/08](#); dynamic wireless traffic scheduling [H04W 72/12](#))}
- 28/0294 . . {forcing collision (non-scheduled or contention based wireless access channel [H04W 74/08](#))}
- 28/04 . . Error control
- NOTE**
- When classifying in this group, classification is also made in the appropriate groups under [H04L 1/00](#).
- 28/06 . . Optimizing {the usage of the radio link}, e.g. header compression, information sizing {, discarding information (system modifying transmission characteristic according to link quality by modifying frame length [H04L 1/0007](#); dynamic adaptation of the packet size for flow control or congestion control [H04L 47/365](#))}
- 28/065 . . . {using assembly or disassembly of packets}
- 28/08 . . Load balancing or load distribution
- WARNING**
- Group [H04W 28/08](#) is impacted by re-classification into groups [H04W 28/0804](#) - [H04W 28/0846](#) and groups [H04W 28/0858](#) - [H04W 28/0992](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 28/0804 . . . {between access entities (reselecting a network for handling traffic [H04W 36/22](#); wireless resource allocation where an allocation plan is defined based on load [H04W 72/52](#))}
- WARNING**
- Groups [H04W 28/0804](#) - [H04W 28/0823](#) are incomplete pending re-classification of documents from group [H04W 28/08](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 28/0808 . . . . {between base stations}
- 28/0812 . . . . {of same hierarchy level}
- 28/0815 . . . . {of different hierarchy levels, e.g. Master Evolved Node B [MeNB] or Secondary Evolved node B [SeNB]}
- 28/0819 . . . . {of different Radio Access Technologies [RATs], e.g. LTE or WiFi}
- 28/0823 . . . . {between wireless and wire-based access points, e.g. via LTE and via DSL connected access points}
- 28/0827 . . . {Triggering entity}
- WARNING**
- Groups [H04W 28/0827](#) – [H04W 28/0838](#) are incomplete pending re-classification of documents from group [H04W 28/08](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 28/0831 . . . . {Core entity}
- 28/0835 . . . . {Access entity, e.g. eNB}
- 28/0838 . . . . {User device}
- 28/0842 . . . {among core entities}
- WARNING**
- Group [H04W 28/0842](#) is incomplete pending re-classification of documents from group [H04W 28/08](#).
- Groups [H04W 28/08](#) and [H04W 28/0842](#) should be considered in order to perform a complete search.
- 28/0846 . . . {between network providers, e.g. operators (selecting a network or a communication service [H04W 40/18](#))}
- WARNING**
- Group [H04W 28/0846](#) is incomplete pending re-classification of documents from group [H04W 28/08](#).
- Groups [H04W 28/08](#) and [H04W 28/0846](#) should be considered in order to perform a complete search.
- 28/085 . . . {among bearers or channels}
- 28/0858 . . . {among entities in the uplink}
- WARNING**
- Group [H04W 28/0858](#) is incomplete pending re-classification of documents from group [H04W 28/08](#).
- Groups [H04W 28/08](#) and [H04W 28/0858](#) should be considered in order to perform a complete search.
- 28/0867 . . . {among entities in the downlink}
- WARNING**
- Group [H04W 28/0867](#) is incomplete pending re-classification of documents from group [H04W 28/08](#).
- Groups [H04W 28/08](#) and [H04W 28/0867](#) should be considered in order to perform a complete search.
- 28/0875 . . . {to or through Device to Device [D2D] links, e.g. direct-mode links}
- WARNING**
- Group [H04W 28/0875](#) is incomplete pending re-classification of documents from group [H04W 28/08](#).
- Groups [H04W 28/08](#) and [H04W 28/0875](#) should be considered in order to perform a complete search.
- 28/0883 . . . {between entities in ad-hoc networks}
- WARNING**
- Groups [H04W 28/0883](#) and [H04W 28/0892](#) are incomplete pending re-classification of documents from group [H04W 28/08](#).
- Groups [H04W 28/08](#), [H04W 28/0883](#) and [H04W 28/0892](#) should be considered in order to perform a complete search.
- 28/0892 . . . . {between different intermediate nodes}

28/09	. . . {Management thereof}	28/0992	. . . . {based on the type of application}
	<b>WARNING</b>		<b>WARNING</b>
	Group <a href="#">H04W 28/09</a> is incomplete pending re-classification of documents from group <a href="#">H04W 28/08</a> .		Group <a href="#">H04W 28/0992</a> is incomplete pending re-classification of documents from group <a href="#">H04W 28/08</a> .
	Groups <a href="#">H04W 28/08</a> and <a href="#">H04W 28/09</a> should be considered in order to perform a complete search.		Groups <a href="#">H04W 28/08</a> and <a href="#">H04W 28/0992</a> should be considered in order to perform a complete search.
28/0908	. . . . {based on time, e.g. for a critical period only}	28/10	. . Flow control {between communication endpoints}
	<b>WARNING</b>	28/12	. . . using signalling between network elements
	Group <a href="#">H04W 28/0908</a> is incomplete pending re-classification of documents from group <a href="#">H04W 28/08</a> .	28/14	. . . using intermediate storage
	Groups <a href="#">H04W 28/08</a> and <a href="#">H04W 28/0908</a> should be considered in order to perform a complete search.	28/16	. Central resource management; Negotiation of resources or communication parameters, e.g. negotiating bandwidth or QoS [Quality of Service]
28/0917	. . . . {based on the energy state of entities}	28/18	. . Negotiating wireless communication parameters
	<b>WARNING</b>	28/20	. . . Negotiating bandwidth
	Group <a href="#">H04W 28/0917</a> is incomplete pending re-classification of documents from group <a href="#">H04W 28/08</a> .	28/22	. . . Negotiating communication rate
	Groups <a href="#">H04W 28/08</a> and <a href="#">H04W 28/0917</a> should be considered in order to perform a complete search.	28/24	. . Negotiating SLA [Service Level Agreement]; Negotiating QoS [Quality of Service]
28/0925	. . . . {using policies}	28/26	. . Resource reservation
	<b>WARNING</b>	<b>36/00</b>	<b>Hand-off or reselection arrangements</b>
	Groups <a href="#">H04W 28/0925</a> - <a href="#">H04W 28/095</a> are incomplete pending re-classification of documents from group <a href="#">H04W 28/08</a> .		<b>NOTE</b>
	Groups <a href="#">H04W 28/08</a> and <a href="#">H04W 28/0925</a> should be considered in order to perform a complete search.		In this group, local priority rules supersede the first-place priority rule (FPPR) applying throughout <a href="#">H04W</a>
28/0933	. . . . . {based on load-splitting ratios}	36/0005	. {Control or signalling for completing the hand-off}
28/0942	. . . . . {based on measured or predicted load of entities- or links}	36/0007	. . {for multicast or broadcast services, e.g. MBMS (multicast or broadcast application services <a href="#">H04W 4/06</a> ; resource management for broadcast services <a href="#">H04W 72/30</a> ; connection management for selective distribution or broadcast <a href="#">H04W 76/40</a> )}
28/095	. . . . . {based on usage history, e.g. usage history of devices}	36/0009	. . {for a plurality of users or terminals, e.g. group communication or moving wireless networks (user group management <a href="#">H04W 4/08</a> ; processing of subscriber group data <a href="#">H04W 8/186</a> )}
28/0958	. . . . . {based on metrics or performance parameters}	36/0011	. . {for data session or connection}
	<b>WARNING</b>	36/0016	. . . {for hand-off preparation}
	Groups <a href="#">H04W 28/0958</a> – <a href="#">H04W 28/0983</a> are incomplete pending re-classification of documents from group <a href="#">H04W 28/08</a> .	36/0022	. . . {for transferring sessions between adjacent core network technologies}
	All groups listed in this Warning should be considered in order to perform a complete search.	36/0027	. . . {for a plurality of sessions or connections, e.g. multi-call, multi-bearer connections}
28/0967	. . . . . {Quality of Service [QoS] parameters}	36/0033	. . . {with transfer of context information}
28/0975	. . . . . {for reducing delays}	36/0038	. . . . {of security context information}
28/0983	. . . . . {for optimizing bandwidth or throughput}	36/0044	. . . . {of quality context information}
		36/005	. . {involving radio access media independent information, e.g. MIH [Media independent Hand-off]}
		36/0055	. . {Transmission and use of information for re-establishing the radio link}
		36/0058	. . . {Transmission of hand-off measurement information, e.g. measurement reports}
		36/0061	. . . {of neighbor cell information}
		36/0066	. . . {of control information between different types of networks in order to establish a new radio link in the target network}
		36/0069	. . . {in case of dual connectivity, e.g. CoMP, decoupled uplink/downlink or carrier aggregation (allocation of physical resources in CoMP or in carrier aggregation <a href="#">H04L 5/0035</a> )}

36/0072	. . . {of resource information of target access point}	40/04	. . . based on wireless node resources
36/0077	. . . {of access information of target access point}	40/06	. . . based on characteristics of available antennas
36/0079	. . . {in case of hand-off failure or rejection}	40/08	. . . based on transmission power
36/0083	. . {Determination of parameters used for hand-off, e.g. generation or modification of neighbour cell lists}	40/10	. . . based on available power or energy
36/00835	. . . {Determination of the neighbour cell list}	40/12	. . . based on transmission quality or channel quality
36/00837	. . . {Determination of triggering parameters for hand-off}	40/125	. . . {using a measured number of retransmissions as a link metric}
36/0085	. . . {Hand-off measurements}	40/14	. . . based on stability
36/0088	. . . . {Scheduling hand-off measurements}	40/16	. . . based on interference
36/0094	. . . . {Definition of hand-off measurement parameters}	40/18	. . . based on predicted events
36/02	. Buffering or recovering information during reselection ; Modification of the traffic flow during hand-off}	40/20	. . . based on geographic position or location
36/023	. . {Buffering or recovering information during reselection}	40/205	. . . {using topographical information, e.g. hills, high rise buildings}
36/026	. . {Multicasting of data during hand-off}	40/22	. . using selective relaying for reaching a BTS [Base Transceiver Station] or an access point
36/03	. {Reselecting a link using a direct mode connection}	40/24	. Connectivity information management, e.g. connectivity discovery or connectivity update
36/04	. Reselecting a cell layer in multi-layered cells	40/242	. . {aging of topology database entries}
36/06	. Reselecting a communication resource in the serving access point	40/244	. . {using a network of reference devices, e.g. beaconing}
36/08	. Reselecting an access point	40/246	. . {Connectivity information discovery}
36/10	. Reselecting an access point controller	40/248	. . {Connectivity information update}
36/12	. Reselecting a serving backbone network switching or routing node	40/26	. . for hybrid routing by combining proactive and reactive routing
36/125	. . {involving different types of service backbone}	40/28	. . for reactive routing
36/14	. Reselecting a network or an air interface	40/30	. . for proactive routing
36/16	. Performing reselection for specific purposes	40/32	. . for defining a routing cluster membership
36/165	. . {for improving the overall network performance (H04W 36/18 - H04W 36/22 take precedence)}	40/34	. Modification of an existing route
36/18	. . for allowing seamless reselection, e.g. soft reselection	40/36	. . due to handover
36/20	. . for optimising the interference level	40/38	. . adapting due to varying relative distances between nodes
36/22	. . for handling the traffic	<b>48/00</b>	<b>Access restriction (access security to prevent unauthorised access H04W 12/08); Network selection; Access point selection</b>
36/24	. Reselection being triggered by specific parameters {used to improve the performance of a single terminal}	48/02	. Access restriction performed under specific conditions
36/245	. . {by historical data}	48/04	. . based on user or terminal location or mobility data, e.g. moving direction, speed
36/26	. . by agreed or negotiated communication parameters	48/06	. . based on traffic conditions
36/28	. . . involving a plurality of connections, e.g. multi-call, multi-bearer connections	48/08	. Access restriction or access information delivery, e.g. discovery data delivery (signalling during connection H04W 76/00)
36/30	. . by measured or perceived connection quality data	48/10	. . using broadcasted information
36/305	. . . {Reselection due to radio link failure (control signalling for hand-off failure H04W 36/0079)}	48/12	. . using downlink control channel
36/32	. . by location or mobility data, e.g. speed data	48/14	. . using user query {or user detection}
36/34	. Reselection control	48/16	. Discovering, processing access restriction or access information
36/36	. . by user or terminal equipment	48/17	. {Selecting a data network PoA [Point of Attachment]}
36/365	. . . {by manual user interaction}	48/18	. Selecting a network or a communication service
36/38	. . by fixed network equipment	48/20	. Selecting an access point
36/385	. . . {of the core network}	<b>52/00</b>	<b>Power management, e.g. TPC [Transmission Power Control], power saving or power classes {(gain control in transmitters or power amplifiers H03G 3/3042)}</b>
<b>40/00</b>	<b>Communication routing or communication path finding</b>	52/02	. Power saving arrangements {(in wired systems H04L 12/12; signaling of mobile application services, e.g. low battery notifications H04W 4/20)}
40/005	. {Routing actions in the presence of nodes in sleep or doze mode}	52/0203	. . {in the radio access network or backbone network of wireless communication networks}
40/02	. Communication route or path selection, e.g. power-based or shortest path routing	52/0206	. . . {in access points, e.g. base stations (access point devices per se H04W 88/08)}
40/023	. . {Limited or focused flooding to selected areas of a network}		
40/026	. . {Route selection considering the moving speed of individual devices}		

52/0209	. . . {in terminal devices ( <a href="#">terminal devices per se H04W 88/02</a> )}	52/143	. . . . {Downlink power control}
52/0212	. . . {managed by the network, e.g. network or access point is master and terminal is slave}	52/146	. . . . {Uplink power control}
52/0216	. . . . {using a pre-established activity schedule, e.g. traffic indication frame}	52/16	. . . Deriving transmission power values from another channel
52/0219	. . . . {where the power saving management affects multiple terminals}	52/18	. . TPC being performed according to specific parameters
52/0222	. . . . {in packet switched networks}	52/20	. . . using error rate
52/0225	. . . {using monitoring of external events, e.g. the presence of a signal}	52/22	. . . taking into account previous information or commands
52/0229	. . . . {where the received signal is a wanted signal}	52/221	. . . . {using past power control commands}
52/0232	. . . . . {according to average transmission signal activity}	52/223	. . . . {predicting future states of the transmission}
52/0235	. . . . {where the received signal is a power saving command}	52/225	. . . . {Calculation of statistics, e.g. average, variance}
52/0238	. . . . {where the received signal is an unwanted signal, e.g. interference or idle signal}	52/226	. . . . {using past references to control power, e.g. look-up-table}
52/0241	. . . . {where no transmission is received, e.g. out of range of the transmitter}	52/228	. . . . {using past power values or information}
52/0245	. . . . {according to signal strength}	52/24	. . . using SIR [Signal to Interference Ratio] or other wireless path parameters
52/0248	. . . . {dependent on the time of the day, e.g. according to expected transmission activity}	52/241	. . . . {taking into account channel quality metrics, e.g. SIR, SNR, CIR, Eb/lo}
52/0251	. . . {using monitoring of local events, e.g. events related to user activity}	52/242	. . . . {taking into account path loss}
52/0254	. . . . {detecting a user operation or a tactile contact or a motion of the device}	52/243	. . . . {taking into account interferences}
52/0258	. . . . {controlling an operation mode according to history or models of usage information, e.g. activity schedule or time of day}	52/244	. . . . . {Interferences in heterogeneous networks, e.g. among macro and femto or pico cells or other sector / system interference [OSI]}
52/0261	. . . {managing power supply demand, e.g. depending on battery level}	52/245	. . . . {taking into account received signal strength}
52/0264	. . . . {by selectively disabling software applications}	52/246	. . . . {where the output power of a terminal is based on a path parameter calculated in said terminal}
52/0267	. . . . {by controlling user interface components}	52/247	. . . . {where the output power of a terminal is based on a path parameter sent by another terminal}
52/027	. . . . . {by controlling a display operation or backlight unit}	52/248	. . . . {where transmission power control commands are generated based on a path parameter}
52/0274	. . . . {by switching on or off the equipment or parts thereof}	52/26	. . . using transmission rate or quality of service QoS [Quality of Service]
52/0277	. . . . . {according to available power supply, e.g. switching off when a low battery condition is detected}	52/262	. . . . {taking into account adaptive modulation and coding [AMC] scheme ( <a href="#">AMC per se H04L 1/0001</a> )}
52/028	. . . . . {switching on or off only a part of the equipment circuit blocks}	52/265	. . . . {taking into account the quality of service QoS}
52/0283	. . . . . {with sequential power up or power down of successive circuit blocks, e.g. switching on the local oscillator before RF or mixer stages}	52/267	. . . . {taking into account the information rate}
52/0287	. . . . {changing the clock frequency of a controller in the equipment}	52/28	. . . using user profile, e.g. mobile speed, priority or network state, e.g. standby, idle or non transmission
52/029	. . . . . {reducing the clock frequency of the controller}	52/281	. . . . {taking into account user or data type priority}
52/0293	. . . . . {having a sub-controller with a low clock frequency switching on and off a main controller with a high clock frequency}	52/282	. . . . {taking into account the speed of the mobile}
52/0296	. . . . {switching to a backup power supply}	52/283	. . . . {Power depending on the position of the mobile}
52/04	. TPC	52/285	. . . . {taking into account the mobility of the user}
52/06	. . TPC algorithms	52/286	. . . . {during data packet transmission, e.g. high speed packet access [HSPA]}
52/08	. . . Closed loop power control	52/287	. . . . {when the channel is in stand-by}
52/10	. . . Open loop power control	52/288	. . . . {taking into account the usage mode, e.g. hands-free, data transmission, telephone}
52/12	. . . Outer and inner loops	52/30	. . using constraints in the total amount of available transmission power
52/125	. . . . {cascaded outer loop power control}	52/32	. . . TPC of broadcast or control channels
52/14	. . . Separate analysis of uplink or downlink	52/322	. . . . {Power control of broadcast channels}
		52/325	. . . . {Power control of control or pilot channels}

- 52/327 . . . . {Power control of multicast channels}
- 52/34 . . . TPC management, i.e. sharing limited amount of power among users or channels or data types, e.g. cell loading
- 52/343 . . . . {taking into account loading or congestion level}
- 52/346 . . . . {distributing total power among users or channels}
- 52/36 . . . with a discrete range or set of values, e.g. step size, ramping or offsets
- 52/362 . . . . {Aspects of the step size}
- 52/365 . . . . {Power headroom reporting}
- 52/367 . . . . {Power values between minimum and maximum limits, e.g. dynamic range}
- 52/38 . . TPC being performed in particular situations
- 52/383 . . . {power control in peer-to-peer links}
- 52/386 . . . {centralized, e.g. when the radio network controller or equivalent takes part in the power control}
- 52/40 . . . during macro-diversity or soft handoff
- 52/42 . . . in systems with time, space, frequency or polarisation diversity
- 52/44 . . . in connection with interruption of transmission
- 52/46 . . . in multi hop networks, e.g. wireless relay networks
- 52/48 . . . during retransmission after error or non-acknowledgment
- 52/50 . . . at the moment of starting communication in a multiple access environment
- 52/52 . . using AGC [Automatic Gain Control] circuits or amplifiers
- 52/54 . . Signalisation aspects of the TPC commands, e.g. frame structure
- 52/545 . . . {modifying TPC bits in special situations}
- 52/56 . . . Detection of errors of TPC bits
- 52/58 . . . Format of the TPC bits
- 52/60 . . . using different transmission rates for TPC commands
  
- 56/00 Synchronisation arrangements**
- 56/0005 . {synchronizing of arrival of multiple uplinks}
- 56/001 . {Synchronization between nodes}
- 56/0015 . . {one node acting as a reference for the others}
- 56/002 . . {Mutual synchronization}
- 56/0025 . . {synchronizing potentially movable access points}
- 56/003 . {Arrangements to increase tolerance to errors in transmission or reception timing}
- 56/0035 . {detecting errors in frequency or phase}
- 56/004 . {compensating for timing error of reception due to propagation delay}
- 56/0045 . . {compensating for timing error by altering transmission time}
- 56/005 . . {compensating for timing error by adjustment in the receiver}
- 56/0055 . {determining timing error of reception due to propagation delay}
- 56/006 . . {using known positions of transmitter and receiver}
- 56/0065 . . {using measurement of signal travel time}
- 56/007 . . . {Open loop measurement}
- 56/0075 . . . . {based on arrival time vs. expected arrival time}
  
- 56/008 . . . . . {detecting arrival of signal based on received raw signal}
- 56/0085 . . . . . {detecting a given structure in the signal}
- 56/009 . . . {Closed loop measurements}
- 56/0095 . . {estimated based on signal strength}
  
- 60/00 Affiliation to network, e.g. registration; Terminating affiliation with the network, e.g. de-registration**
- 60/005 . {Multiple registrations, e.g. multihoming}
- 60/02 . by periodical registration
- 60/04 . using triggered events
- 60/06 . De-registration or detaching
  
- 64/00 Locating users or terminals {or network equipment} for network management purposes, e.g. mobility management**
- 64/003 . {locating network equipment}
- 64/006 . {with additional information processing, e.g. for direction or speed determination}
  
- 68/00 User notification, e.g. alerting and paging, for incoming communication, change of service or the like**
- 68/005 . {Transmission of information for alerting of incoming communication}
- 68/02 . Arrangements for increasing efficiency of notification or paging channel
- 68/025 . . {Indirect paging}
- 68/04 . multi-step notification using statistical or historical mobility data
- 68/06 . using multi-step notification by changing the notification area
- 68/08 . using multi-step notification by increasing the notification area
- 68/10 . using simulcast notification
- 68/12 . Inter-network notification
  
- 72/00 Local resource management**
- 72/02 . Selection of wireless resources by user or terminal
  
- WARNING**
- Group [H04W 72/02](#) is impacted by reclassification into group [H04W 72/40](#).
- Groups [H04W 72/02](#) and [H04W 72/40](#) should be considered in order to perform a complete search.
  
- 72/04 . Wireless resource allocation
  
- WARNING**
- Group [H04W 72/04](#) is impacted by reclassification into groups [H04W 72/11](#), [H04W 72/115](#) and [H04W 72/40](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
  
- 72/044 . . based on the type of the allocated resource
  
- WARNING**
- Group [H04W 72/044](#) is impacted by reclassification into group [H04W 72/0457](#).
- Groups [H04W 72/044](#) and [H04W 72/0457](#) should be considered in order to perform a complete search.



## H04W

- 72/0446 . . . Resources in time domain, e.g. slots or frames
- 72/0453 . . . Resources in frequency domain, e.g. a carrier in FDMA
- 72/0457 . . . Variable allocation of band or rate

### **WARNING**

Group [H04W 72/0457](#) is incomplete pending reclassification of documents from group [H04W 72/044](#).

Groups [H04W 72/044](#) and [H04W 72/0457](#) should be considered in order to perform a complete search.

- 72/046 . . . {the resource being in the space domain, e.g. beams}
- 72/0466 . . . {the resource being a scrambling code}
- 72/0473 . . . {the resource being transmission power}
- 72/11 . . Semi-persistent scheduling

### **WARNING**

Group [H04W 72/11](#) is incomplete pending reclassification of documents from group [H04W 72/04](#).

Groups [H04W 72/04](#) and [H04W 72/11](#) should be considered in order to perform a complete search.

- 72/115 . . Grant-free or autonomous transmission

### **WARNING**

Group [H04W 72/115](#) is incomplete pending reclassification of documents from group [H04W 72/04](#).

Groups [H04W 72/04](#) and [H04W 72/115](#) should be considered in order to perform a complete search.

- 72/12 . Wireless traffic scheduling

### **WARNING**

Group [H04W 72/12](#) is impacted by reclassification into groups [H04W 72/40](#), [H04W 72/50](#), [H04W 72/51](#) and [H04W 72/512](#).

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

- 72/121 . . for groups of terminals or users
- 72/1215 . . {for collaboration of different radio technologies}
- 72/1221 . . {based on age of data to be sent}
- 72/1263 . . Mapping of traffic onto schedule, e.g. scheduled allocation or multiplexing of flows
- 72/1268 . . . of uplink data flows
- 72/1273 . . . of downlink data flows
- 72/20 . Control channels or signalling for resource management

### **WARNING**

Group [H04W 72/20](#) is impacted by reclassification into groups [H04W 72/25](#), [H04W 72/27](#) and [H04W 72/29](#).

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

- 72/21 . . in the uplink direction of a wireless link, i.e. towards the network
- 72/23 . . in the downlink direction of a wireless link, i.e. towards a terminal

### **WARNING**

Group [H04W 72/23](#) is impacted by reclassification into groups [H04W 72/231](#) and [H04W 72/232](#).

Groups [H04W 72/23](#), [H04W 72/231](#) and [H04W 72/232](#) should be considered in order to perform a complete search.

- 72/231 . . . the control data signalling from the layers above the physical layer, e.g. RRC or MAC-CE signalling

### **WARNING**

Group [H04W 72/231](#) is incomplete pending reclassification of documents from group [H04W 72/23](#).

Groups [H04W 72/23](#) and [H04W 72/231](#) should be considered in order to perform a complete search.

- 72/232 . . . the control data signalling from the physical layer, e.g. DCI signalling

### **WARNING**

Group [H04W 72/232](#) is incomplete pending reclassification of documents from group [H04W 72/23](#).

Groups [H04W 72/23](#) and [H04W 72/232](#) should be considered in order to perform a complete search.

- 72/25 . . between terminals via a wireless link, e.g. sidelink

### **WARNING**

Group [H04W 72/25](#) is incomplete pending reclassification of documents from group [H04W 72/20](#).

Groups [H04W 72/20](#) and [H04W 72/25](#) should be considered in order to perform a complete search.

- 72/27 . . between access points

### **WARNING**

Group [H04W 72/27](#) is incomplete pending reclassification of documents from group [H04W 72/20](#).

Groups [H04W 72/20](#) and [H04W 72/27](#) should be considered in order to perform a complete search.

- 72/29 . . between an access point and the access point controlling device  
**WARNING**  
 Group [H04W 72/29](#) is incomplete pending reclassification of documents from group [H04W 72/20](#).  
 Groups [H04W 72/20](#) and [H04W 72/29](#) should be considered in order to perform a complete search.
- 72/30 . Resource management for broadcast services
- 72/40 . Resource management for direct mode communication, e.g. D2D or sidelink  
**WARNING**  
 Group [H04W 72/40](#) is incomplete pending reclassification of documents from groups [H04W 72/02](#), [H04W 72/04](#) and [H04W 72/12](#).  
 All groups listed in this Warning should be considered in order to perform a complete search.
- 72/50 . Allocation or scheduling criteria for wireless resources  
**WARNING**  
 Group [H04W 72/50](#) is incomplete pending reclassification of documents from group [H04W 72/12](#).  
 Groups [H04W 72/12](#) and [H04W 72/50](#) should be considered in order to perform a complete search.
- 72/51 . . based on terminal or device properties  
**WARNING**  
 Group [H04W 72/51](#) is incomplete pending reclassification of documents from group [H04W 72/12](#).  
 Group [H04W 72/51](#) is also impacted by reclassification into group [H04W 72/512](#).  
 Groups [H04W 72/12](#), [H04W 72/51](#) and [H04W 72/512](#) should be considered in order to perform a complete search.
- 72/512 . . . for low-latency requirements, e.g. URLLC  
**WARNING**  
 Group [H04W 72/512](#) is incomplete pending reclassification of documents from groups [H04W 72/12](#) and [H04W 72/51](#).  
 Groups [H04W 72/12](#), [H04W 72/51](#) and [H04W 72/512](#) should be considered in order to perform a complete search.
- 72/52 . . based on load
- 72/53 . . based on regulatory allocation policies
- 72/535 . . {based on resource usage policies}
- 72/54 . . based on quality criteria  
**WARNING**  
 Group [H04W 72/54](#) is impacted by reclassification into group [H04W 72/541](#).  
 Groups [H04W 72/54](#) and [H04W 72/541](#) should be considered in order to perform a complete search.
- 72/541 . . . using the level of interference  
**WARNING**  
 Group [H04W 72/541](#) is incomplete pending reclassification of documents from group [H04W 72/54](#).  
 Groups [H04W 72/54](#) and [H04W 72/541](#) should be considered in order to perform a complete search.
- 72/542 . . . using measured or perceived quality
- 72/543 . . . based on requested quality, e.g. QoS
- 72/56 . . based on priority criteria  
**WARNING**  
 Group [H04W 72/56](#) is impacted by reclassification into group [H04W 72/566](#).  
 Groups [H04W 72/56](#) and [H04W 72/566](#) should be considered in order to perform a complete search.
- 72/563 . . . of the wireless resources
- 72/566 . . . of the information or information source or recipient  
**WARNING**  
 Group [H04W 72/566](#) is incomplete pending reclassification of documents from group [H04W 72/56](#).  
 Groups [H04W 72/56](#) and [H04W 72/566](#) should be considered in order to perform a complete search.
- 72/569 . . . . {of the traffic information}
- 74/00 Wireless channel access, e.g. scheduled or random access**
- 74/002 . {Transmission of channel access control information}
- 74/004 . . {in the uplink, i.e. towards network}
- 74/006 . . {in the downlink, i.e. towards the terminal}
- 74/008 . . {with additional processing of random access related information at receiving side}
- 74/02 . Hybrid access techniques
- 74/04 . Scheduled {or contention-free} access ([H04W 74/02 takes precedence](#))
- 74/06 . . using polling
- 74/08 . Non-scheduled {or contention based} access, e.g. random access, ALOHA, CSMA [Carrier Sense Multiple Access] ([H04W 74/02 takes precedence](#))
- 74/0808 . . {using carrier sensing, e.g. as in CSMA}
- 74/0816 . . . {carrier sensing with collision avoidance}
- 74/0825 . . . {carrier sensing with collision detection}
- 74/0833 . . {using a random access procedure}
- 74/0841 . . . {with collision treatment}
- 74/085 . . . . {collision avoidance}
- 74/0858 . . . . {collision detection}

74/0866	. . {using a dedicated channel for access}		
74/0875	. . . {with assigned priorities based access}		
74/0883	. . . {for un-synchronized access}		
74/0891	. . . {for synchronized access}		
<b>76/00</b>	<b>Connection management</b>		
76/10	. Connection setup		
76/11	. . Allocation or use of connection identifiers	84/005	. {Moving wireless networks}
76/12	. . Setup of transport tunnels	84/02	. Hierarchically pre-organised networks, e.g. paging networks, cellular networks, WLAN [Wireless Local Area Network] or WLL [Wireless Local Loop]
76/14	. . Direct-mode setup		
76/15	. . Setup of multiple wireless link connections		
76/16	. . . Involving different core network technologies, e.g. a packet-switched [PS] bearer in combination with a circuit-switched [CS] bearer	84/022	. . {One-way selective calling networks, e.g. wide area paging}
76/18	. . Management of setup rejection or failure	84/025	. . . {with acknowledge back capability}
76/19	. . Connection re-establishment	84/027	. . . {providing paging services}
76/20	. Manipulation of established connections	84/04	. . Large scale networks; Deep hierarchical networks
76/22	. . Manipulation of transport tunnels	84/042	. . . {Public Land Mobile systems, e.g. cellular systems}
76/23	. . Manipulation of direct-mode connections	84/045	. . . . {using private Base Stations, e.g. femto Base Stations, home Node B}
76/25	. . Maintenance of established connections	84/047	. . . . {using dedicated repeater stations}
76/27	. . Transitions between radio resource control [RRC] states	84/06	. . . Airborne or Satellite Networks (space-based or airborne stations <a href="#">H04B 7/185</a> )
76/28	. . Discontinuous transmission [DTX]; Discontinuous reception [DRX]	84/08	. . . Trunked mobile radio systems
76/30	. Connection release	84/10	. . Small scale networks; Flat hierarchical networks
76/32	. . Release of transport tunnels	84/105	. . . {PBS [Private Base Station] network ( <a href="#">H04W 84/12</a> - <a href="#">H04W 84/16</a> take precedence)}
76/34	. . Selective release of ongoing connections	84/12	. . . WLAN [Wireless Local Area Networks]
76/36	. . . for reassigning the resources associated with the released connections	84/14	. . . WLL [Wireless Local Loop]; RLL [Radio Local Loop]
76/38	. . triggered by timers	84/16	. . . WPBX [Wireless Private Branch Exchange]
76/40	. for selective distribution or broadcast	84/18	. Self-organising networks, e.g. ad-hoc networks or sensor networks
76/45	. . for Push-to-Talk [PTT] or Push-to-Talk over cellular [PoC] services	84/20	. . Master-slave {selection or change} arrangements
76/50	. for emergency connections	84/22	. . with access to wired networks
<b>80/00</b>	<b>Wireless network protocols or protocol adaptations to wireless operation</b>	<b>88/00</b>	<b>Devices specially adapted for wireless communication networks, e.g. terminals, base stations or access point devices</b>
80/02	. Data link layer protocols	88/005	. {Data network PoA devices}
80/04	. Network layer protocols, e.g. mobile IP [Internet Protocol]	88/02	. Terminal devices
80/045	. . {involving different protocol versions, e.g. MIPv4 and MIPv6}	88/021	. . {adapted for Wireless Local Loop operation}
80/06	. Transport layer protocols, e.g. TCP [Transport Control Protocol] over wireless {(transmission control protocol/Internet protocol [TCP/IP] or user datagram protocol [UDP] <a href="#">H04L 69/16</a> )}	88/022	. . {Selective call receivers}
80/08	. Upper layer protocols {(network arrangements or communication protocols for networked applications <a href="#">H04L 67/00</a> )}	88/023	. . . {with message or information receiving capability}
80/085	. . {involving different upper layer protocol versions, e.g. LCS - SUPL or WSN-SOA-WSDP}	88/025	. . . . {Selective call decoders}
80/10	. . adapted for {application} session management, e.g. SIP [Session Initiation Protocol] {(connection management <a href="#">H04W 76/00</a> ; arrangements for session management <a href="#">H04L 67/14</a> )}	88/026	. . . . {using digital address codes}
80/12	. . Application layer protocols, e.g. WAP [Wireless Application Protocol]	88/027	. . . . {using frequency address codes}
		88/028	. . . . {using pulse address codes}
		88/04	. . adapted for relaying to or from another terminal or user
		88/06	. . adapted for operation in multiple networks {or having at least two operational modes}, e.g. multi-mode terminals
		88/08	. Access point devices
		88/085	. . {Access point devices with remote components}
		88/10	. . adapted for operation in multiple networks, e.g. multi-mode access points
		88/12	. Access point controller devices
		88/14	. Backbone network devices
		88/16	. Gateway arrangements
		88/18	. Service support devices; Network management devices

## H04W

- 88/181 . . {Transcoding devices; Rate adaptation devices}
- 88/182 . . {Network node acting on behalf of an other network entity, e.g. proxy}
- 88/184 . . {Messaging devices, e.g. message centre}
- 88/185 . . {Selective call encoders for paging networks, e.g. paging centre devices}
- 88/187 . . . {using digital or pulse address codes}
- 88/188 . . . {using frequency address codes}

### **92/00 Interfaces specially adapted for wireless communication networks**

- 92/02 . Inter-networking arrangements
- 92/04 . Interfaces between hierarchically different network devices
- 92/045 . . {between access point and backbone network device}
- 92/06 . . between gateways and public network devices
- 92/08 . . between user and terminal device
- 92/10 . . between terminal device and access point, i.e. wireless air interface
- 92/12 . . between access points and access point controllers
- 92/14 . . between access point controllers and backbone network device
- 92/16 . Interfaces between hierarchically similar devices
- 92/18 . . between terminal devices
- 92/20 . . between access points
- 92/22 . . between access point controllers
- 92/24 . . between backbone network devices

### **99/00 Subject matter not provided for in other groups of this subclass**