CLAIMS

1. A wireless communication device comprising:

a short range receiving unit that sets a reception channel to a channel selected from a control channel and a plurality of service channels, wherein the control channel and the plurality of service channels have different frequencies from each other, the short range receiving unit receives, from a service providing station, service start information while the reception channel is set to the control channel, the service start information includes information defining a type of a service, service priority information defining a priority of the service, and information defining a service channel of the service, the short range receiving unit receives, from the service providing station, service execution information which is information for execution of the service while the reception channel is set to the service channel;

a channel control unit that controls a setting of the reception channel to the control channel or to the service channel, wherein a time frame is divided alternately into a control channel time frame and a service channel time frame under a reference time division, the reception channel is set to the control channel during the control channel time frame and the reception channel is set to the service channel during the service channel time frame, the channel control unit sets the reception channel as the control channel during the control channel time frame, when the short range receiving unit receives the service start information related to a standard start service during the control channel time frame, the channel control unit maintains the reception channel as the control channel for an extension time frame after a reception of the service start information, the extension time frame is defined as a predetermined number of the service channel time frames, and the standard start service is a service which requires the reception channel is set to the service channel from a beginning of the service channel time frame; and

an execution service determination unit that sets a part or all of the service start information received by the short range receiving unit as service start information for comparing priorities while the reception channel is set to

the control channel, determines the service having a highest priority among the services indicated by the service start information for comparing priorities based on the service priority information included in the service start information, and performs an execution service determination process in which the service determined to have the highest priority is set as an execution service,

wherein,

when the execution service determination unit determines the standard start service as the execution service, the channel control unit sets the reception channel to the service channel according to the service start information of the execution service from a beginning of a next service channel time frame after the extension time frame has elapsed, and

the execution service determination unit receives the service execution information using the service channel.

2. The wireless communication device according to claim 1, further comprising

a reception strength determination unit that determines a reception strength of each service start information received by the wireless communication device,

wherein,

in the execution service determination process, the execution service determination unit determines, as the execution service, the service having the highest priority out of the services indicated by respective service start information each of which having the reception strength equal to or stronger than a threshold strength, and

the service start information is received by the short range receiving unit while the reception channel is set as the control channel by the channel control unit.

3. The wireless communication device according to claim 1, wherein

the service start information includes position information indicating a position of the service providing station that transmits the service start

information,

the wireless communication device further comprises:

a position detection unit that sequentially detects a current position of the wireless communication device; and

a distance calculation unit that calculates a distance between the service providing station which transmits the service start information and the wireless communication device for each service start information based on the current position detected by the position detection unit and the position information of the service providing station included in the service start information,

in the execution service determination process, the execution service determination unit determines, as the execution service, the service having the highest priority out of the services indicated by the respective service start information, the distance calculated by the distance calculation unit for each service start information is referred to as the distance of the service, and each of the services from which the execution service is determined has the distance equal to or less than a threshold distance, and

the service start information is received by the short range receiving unit while the reception channel is set as the control channel by the channel control unit.

4. The wireless communication device according to claim 1, wherein

the service start information includes position information indicating a position of the service providing station that transmits the service start information,

the wireless communication device further comprises:

a position detection unit that sequentially detects a current position of the wireless communication device; and

an azimuth difference calculation unit that calculates an azimuth difference between an azimuth of the service providing station which transmits the service start information and a traveling azimuth of the wireless communication device based on the current position detected by the position detection unit and the position information of the service providing station

included in the service start information, the azimuth of the service providing station is determined using the traveling azimuth of the wireless communication device as a reference,

in the execution service determination process, the execution service determination unit determines, as the execution service, the service having the highest priority out of the services indicated by the respective service start information, the azimuth difference calculated by the azimuth difference calculation unit for each service start information is referred to as the azimuth difference of the service, and each of the services from which the execution service is determined has the azimuth difference equal to or less than a threshold azimuth difference, and

the service start information is received by the short range receiving unit while the reception channel is set as the control channel by the channel control unit.

5. The wireless communication device according to claim 2, wherein

the service start information includes position information indicating a position of the service providing station that transmits the service start information,

the wireless communication device further comprises:

a position detection unit that sequentially detects a current position of the wireless communication device; and

an azimuth difference calculation unit that calculates an azimuth difference between an azimuth of the service providing station which transmits the service start information and a traveling azimuth of the wireless communication device based on the current position detected by the position detection unit and the position information of the service providing station included in the service start information, the azimuth of the service providing station is determined using the traveling azimuth of the wireless communication device as a reference,

in the execution service determination process, the execution service determination unit determines, as the execution service, the service having the highest priority out of the services indicated by the respective service start

information, the azimuth difference calculated by the azimuth difference calculation unit for each service start information is referred to as the azimuth difference of the service, and each of the services from which the execution service is determined has the reception strength equal to or stronger than the threshold strength and has the azimuth difference equal to or less than a threshold azimuth difference, and

the service start information is received by the short range receiving unit while the reception channel is set as the control channel by the channel control unit.

6. The wireless communication device according to claim 3, further comprising

an azimuth difference calculation unit that calculates an azimuth difference between an azimuth of the service providing station which transmits the service start information and a traveling azimuth of the wireless communication device based on the current position detected by the position detection unit and the position information of the service providing station included in the service start information, the azimuth of the service providing station is determined using the traveling azimuth of the wireless communication device as a reference,

wherein,

in the execution service determination process, the execution service determination unit determines, as the execution service, the service having the highest priority out of the services indicated by the respective service start information, the azimuth difference calculated by the azimuth difference calculation unit for each service start information is referred to as the azimuth difference of the service, and each of the services from which the execution service is determined has the distance equal to or less than the threshold distance and has the azimuth difference equal to or less than a threshold azimuth difference, and

the service start information is received by the short range receiving unit while the reception channel is set as the control channel by the channel control unit.

7. The wireless communication device according to claim 1, wherein

the service execution information includes information transmitted from the service providing station and information transmitted from the wireless communication device,

the service providing station is capable of transmitting and receiving the service execution information via a short range communication and is capable of transmitting and receiving the service execution information via a wide area communication network,

the service start information includes information indicating a data size required to be transmitted and received by the wireless communication device for executing the service,

in the execution service determination process, the execution service determination unit determines, as the execution service, the service having the highest priority out of the services indicated by the respective service start information, each of the services from which the execution service is determined has the data size equal to or greater than a threshold size,

the service start information is received by the short range receiving unit while the reception channel is set as the control channel by the channel control unit, and

the wireless communication device further comprises:

a short range transmission unit that performs a short range transmission;

a wide area communication unit that performs a communication using a wide area communication network; and

a communication switching unit that transmits and receives the service execution information to and from the service providing station with the use of the short range receiving unit and the short range transmission unit when the short range receiving unit and the short range transmission unit are capable of communicating with the service providing station, and transmits and receives the service execution information to and from the service providing station with the use of the wide area communication unit when the short range receiving unit and the short range transmission unit are incapable

of communicating with the service providing station.

8. The wireless communication device according to any one of claims 1 to 7, further comprising

a storage unit that stores the service start information received while the reception channel is set as the control channel by the channel control unit,

wherein the execution service determination unit performs the execution service determination process with the service related to the service start information which has not yet been executed out of the service start information stored in the storage unit as a target service, and determines the execution service

9. The wireless communication device according to any one of claims 1 to 8, wherein

the service start information includes an immediate start instruction for instructing the channel control unit to set the reception channel as the service channel immediately upon receiving of the service start information,

the execution service determination unit determines whether each service start information that is received includes the immediate start instruction while the reception channel is set as the control channel, and sets the execution service as the service determined by the service start information including the immediate start instruction when determining that the service start information includes the immediate start instruction, and

when the execution service determination unit determines, as the execution service, the service corresponding to the service start information including the immediate start instruction, the channel control unit sets the reception channel to the service channel immediately after the execution service determination unit determines the execution service.