

The Ping floor selection algorithm

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Floor search "Ping" algorithm

We need a simple algorithm that ensures a Cabin services all stop and floor requests in its Shaft. Here is a proposed algorithm which accomplishes this by keeping the Cabin moving in one direction as long as possible before reversing. It is called "Ping" because it can be visualized as a submarine issuing a sonar ping which spreads outward and then bounces back.

The entire Shaft can be searched by performing two "pings"; one in front of the Cabin and one behind it. Each ping consists of an outward and inward phase 1-2 and 3-4, illustrated below. The phases are executed in order and the first qualifying request yields a destination with no need to continue searching. If no requests are pending, no destination will be found and the Cabin will wait at its current location.

Key

▽

▲

Floor request (up or down)

⊗

Stop request

↑

Travel direction

●

Next destination

↕

Direction and maximum extent of search

Proceed in this order and quit as soon as a qualifying destination is found or all four phases are exhausted with no result.

