

Range Coverage Radio Configurations

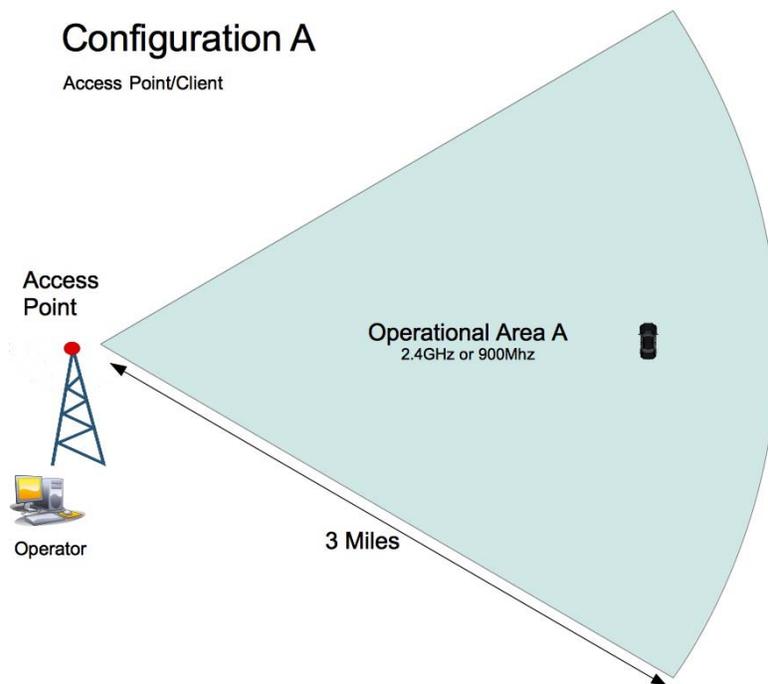
To support a variety of range operations, Kairos Autonomi recommends several radio configurations that can be used to cover different types of operational areas.

Assumptions

- Backhaul frequency is 5.8GHz (standard) but could be 2.4GHz or 900MHz
- Sector antennas are 120°
- Towers are 40-60 feet tall

Configuration A – Access Point/Client

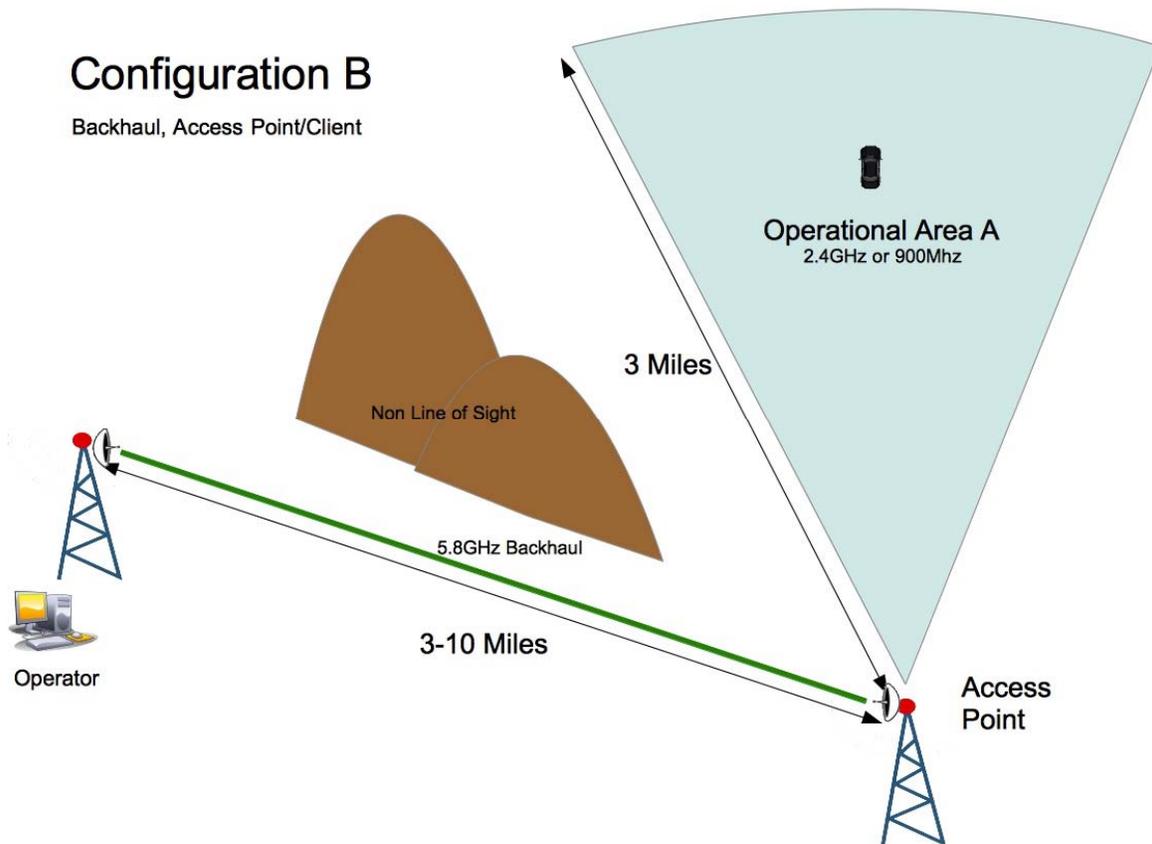
This configuration has a single frequency (2.4GHz or 900MHz) access point (AP) radio installed on the same tower or location from where the operator will be running vehicles. The antenna is located and positioned so that its beam width will cover the area where the vehicle will operate. The antenna can be either omnidirectional or sector. The vehicle uses an omnidirectional antenna and a single frequency radio set up as a client to the AP. This requires line of sight between the AP and the client. The common operating range in this configuration is 1-3 miles.



Configuration B – Backhaul, Access Point/Client

This configuration uses a single frequency (5.8GHz) to backhaul from the location of the operator to a secondary tower using dish antennas. The radio on the secondary tower is then setup as an access point on 2.4GHz or 900MHz that will cover the area of operation. The radio on the vehicle is setup as a client to the access point on the secondary tower.

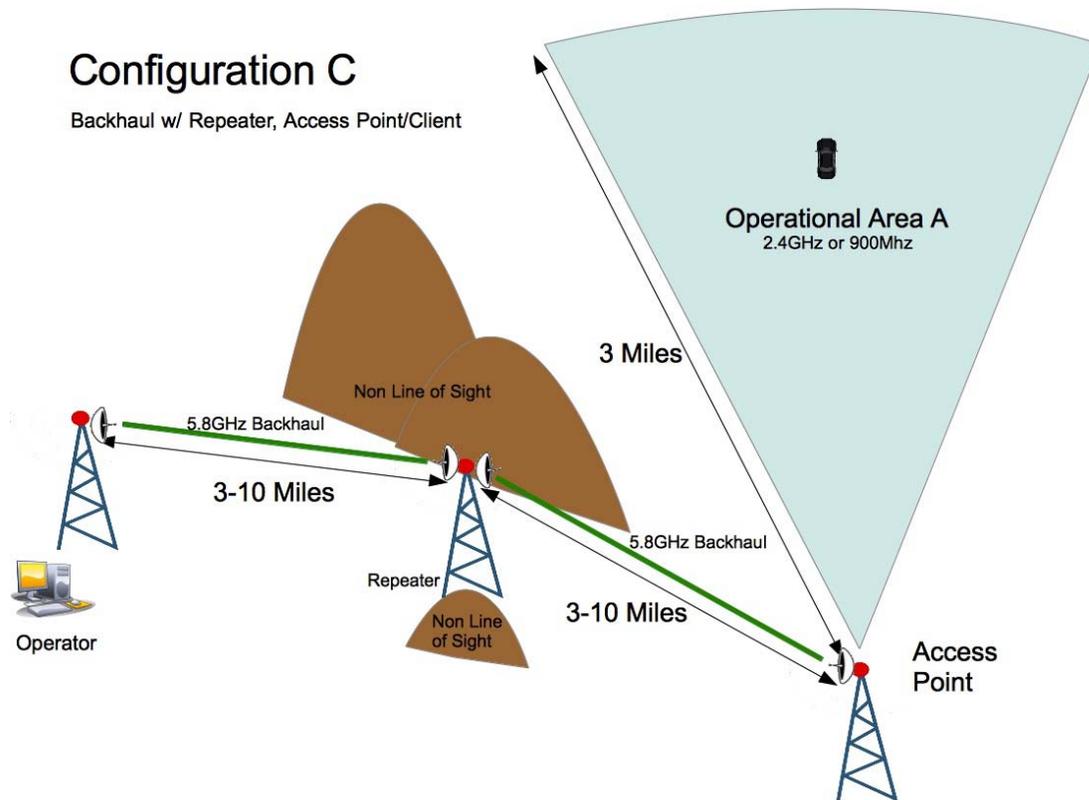
This requires line of sight between the AP and the clients, and the backhaul radios on the main and secondary towers but not the main tower and the area of operation. The backhaul range is 3-10 miles, and the operating range is 1-3 miles.



Configuration C – Backhaul w/ Repeater, Access Point/Client

This configuration is similar to Configuration B but uses a repeater tower to extend the backhaul distance or to maintain line of sight between towers. This configuration uses a single frequency (5.8GHz) to backhaul from the location of the operator to a repeater tower using dish antennas. The data path continues from the repeater tower to a third tower. The radio on the third tower is then setup as an access point on 2.4GHz or 900MHz that will cover the area of operation. The radio on the vehicle is setup as a client to the access point on the secondary tower.

This requires line of sight between the AP and the clients, and the backhaul radios on the main and secondary towers but not the main tower and the area of operation. The backhaul range between towers is 3-10 miles, and the operating range is 1-3 miles.



Configuration D – Dual Backhaul, Dual Access Point/Client

This configuration is similar to Configuration B but supports two distinct areas of operation. A single frequency (5.8GHz) is used to backhaul from the location of the operator to a secondary tower using dish antennas. An additional 5.8GHz link is used to backhaul from the operator to a third tower using dish antennas. The radio on the secondary tower is then setup as an access point on 2.4GHz or 900MHz that will cover one area of operation. The radio on the third tower is then setup as an access point on 2.4GHz or 900MHz that will cover a separate area of operation. The radio on the vehicle is setup as a client to the access point on either tower but can only operate within one area at a time and may not cross from one area to the other.

This requires line of sight between the AP and the clients, and the backhaul radios on the main and secondary towers but not the main tower and the area of operation. The backhaul range is 3-10 miles, and the operating range is 1-3 miles.

