CLAIMS

What is claimed is:

1. A system for providing access to a wireless network, comprising:

a plurality of integrated access points, each of the access points comprising components including at least a radio, a controller, and a flexible printed circuit board (PCB) printed antenna,

at least the radio and controller of each respective integrated access point being assembled on a corresponding rigid assembly board,

a means for transmitting radiofrequency signals being configured to distribute radiofrequency signals from each rigid assembly board to a respective flexible PCB printed antenna, and

each integrated access point being embedded into a material expanse that integrates the components of the integrated access points; and

a unified backplane interconnect, the unified backplane interconnect comprising a plurality of interconnects communicatively coupled in series, each interconnect connecting adjacent integrated access points.

2. The system of claim 1, the material expanse comprising a strip, and the unified backplane interconnect comprising discrete interconnect cables that couple the integrated access points.

3. The system of claim 2, each assembly board being embedded into a respective built-up strip enclosure comprising a potting, and each strip enclosure further comprising at least one of a foil, a foam, or a plastic tape in direct contact with each respective assembly board.

4. The system of claim 1, the unified backplane interconnect further comprising a head-end configured to receive electrical power and communicate with the wireless network, the head-end comprising an External Network to Backplane Converter, the head-end being coupled to a first integrated access point by a first interconnect.

5. The system of claim 2, each assembly board comprising a rigid card and one or more subassembly boards, each rigid card comprising a power supply, a network transceiver, and the respective controller of one of the integrated access points, and each subassembly board comprising a Wi-Fi transceiver, the respective rigid card and one or more subassembly boards of each integrated access point being coupled in series.

6. The system of claim 5, each Wi-Fi transceiver comprising a radio module that emits complex analog baseband signals and one or more additional modules that upconvert, switch, and amplify the signals.

7. The system of claim 1, each controller comprising a CPU with two USB PHYs, a DMA engine, one or more cores, and memory, the DMA engine connecting the USB PHYs to the memory, and each interconnect connecting adjacent integrated access points comprising a USB cable.

8. The system of claim 1, each controller comprising a CPU and a plurality of integrated access points each comprising a USB Hub, each integrated access point not comprising a USB Hub comprising a midspan card that terminates a leftmost USB tree and generates a new USB tree, and each interconnect connecting adjacent integrated access points comprising a USB cable, wherein for any series of up to the maximum number of adjacent integrated access points supported by the underlying USB standard at least one integrated access point comprises a CPU that comprises a midspan card.

9. The system of claim 1, each controller comprising a CPU with one or more Wi-Fi transceivers, each CPU configured to use Wi-Fi as a captive backhaul, and each interconnect connecting adjacent integrated access points comprising a coaxial cable.

10. The system of claim 2, the radio of each integrated access point comprising one of a vector baseband radio or digital baseband radio, and each integrated access point comprising at least one other radio.

11. The system of claim 2, at least one assembly board comprising a Wi-Fi transceiver, and at least one other assembly board comprising a transceiver that is not a Wi-Fi transceiver.

12. The system of claim 1, the components of each integrated access point further comprising a power supply and a network transceiver.

13. A system for providing access to a wireless network, comprising:

a plurality of integrated access points each comprising components including at least a radio, a controller, an antenna, and a USB Hub, each integrated access point being embedded into a material expanse that integrates the components of the integrated access points; and

a unified backplane interconnect, the unified backplane interconnect comprising a plurality of interwoven USB interconnect lines, each USB interconnect line comprising a plurality of USB cables communicatively coupled in series through one or more USB Hubs, each USB cable of each USB interconnect line connecting a pair of integrated access points that are not adjacent.

14. The system of claim 13, the material expanse comprising a strip, and the distance from the radio of a first integrated access point to the radio of at least one other integrated access point being at least ten feet.

15. The system of claim 13, wherein:

at least the radio, controller, and USB Hub of each respective integrated access point being assembled on one or more corresponding rigid assembly boards;

the antenna of each integrated access point being a flexible PCB printed antenna; and

a means for transmitting radiofrequency signals being configured to distribute radiofrequency signals from each rigid assembly board to a respective antenna.

16. The system of claim 15,

the material expanse comprising a strip,

each assembly board being embedded into a respective built-up strip enclosure comprising a fill, and

each strip enclosure further comprising at least one of a foil, a foam, or a plastic tape in direct contact with each respective assembly board.

17. The system of claim 15, each assembly board further comprising a USB signal conditioner.

18. The system of claim 15, each assembly board coupled to at least one separate signal conditioner card comprising a USB signal conditioner.

19. A system for providing access to a wireless network, comprising:

a plurality of integrated access points each comprising components including at least a radio, a CPU, an antenna, and an off-CPU Ethernet switch, each integrated access point being embedded into a material expanse that integrates the components of the integrated access points;

at least the radio, CPU, and Ethernet switch of each respective integrated access point being assembled on one or more corresponding rigid assembly boards; and

a unified backplane interconnect, the unified backplane interconnect comprising one or more Ethernet interconnect lines, each Ethernet interconnect line comprising a plurality of Ethernet cables communicatively coupled in series through one or more off-CPU Ethernet switches, each Ethernet cable of each Ethernet interconnect line connecting a pair of integrated access points.

20. The system of claim 19, further comprising at least two Ethernet interconnect lines, each of the at least two Ethernet interconnect lines being interwoven and only connecting integrated access points that are not adjacent.