AREDN® "Starter Kit"

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An AREDN® mesh node needs a radio, antenna, Power Over Ethernet (PoE) injector (or adapter), a long STP Ethernet Cat5e cable to reach your antenna/radio, and a short Ethernet Cat5e jumper (or two). All are available on Amazon for less than $175 total. Use https://smile.amazon.com/ to support the ARRL or your favorite charity. Use the following links (but note that they may expire) and then check for lower prices and/or Amazon Prime resellers.

1. Ubiquiti® "Bullet M2" transceiver, https://smile.amazon.com/gp/product/B00HXT8DNM, $75. You don't want the "Titanium" version (more expensive and no indicator lights) unless you're planning a permanent outdoor installation. This transceiver attaches *directly* to the antenna and produces up to 28dBm of gain.
2. A 2.4 GHz omnidirectional 12dBi antenna, https://smile.amazon.com/gp/product/B003CFATO2, $37. This will give you a total of up to 40dBm gain, or 10W EIRP. There's also a 15dBi version (almost 20W EIRP) for another $15. An airGrid M2 dish, used for directional links, can provide up to 28dBm + 20dBi = 63W EIRP but it is not designed for frequencies below 2.412 GHz and we'll be operating at 2.397 GHz. An omnidirectional antenna is probably best in an ad hoc environment, *e.g.*, the Marine Corps Marathon, so others can route through your node automatically, if needed, without you knowing where they're located and vice versa.
3. Ubiquiti® 24VDC, 24W (1 Amp) PoE injector, https://smile.amazon.com/gp/product/B004EFHN66, $16. This is model **POE-24-24W**, not model POE-24-24W-**G**. Yes, you want the 24VDC injector that produces 1.0 Amp *minimum* output. This PoE requires 120VAC (or 240VAC) input so you need an inverter or generator in the field. There are multi-port switches that have built-in PoE which could be handy for connecting multiple devices but this will get you going at minimum cost.
4. 50' of *shielded* twisted pair (STP) Cat5e cable, https://smile.amazon.com/gp/product/B00A6ULZG2, $30. This is the "feedline"; there's no coax! RF at 2.4 GHz is downconverted to a digital signal at the transceiver to minimize loss. You might be able to get away with UTP but in any kind of RF environment STP is good insurance. This cable will go from the PoE injector's "POE" port to the transceiver to transfer data to/from your laptop and supply 24VDC power.
5. A short Cat5e jumper to get from the PoE injector's "LAN" port to your laptop. Do you really need to order one of these? Surely you have about ten of these stashed away somewhere; they came with every WiFi router you ever bought. A second short jumper is handy for flashing your node through the "POE" port but at some point you do need to test the long STP cable.
6. You'll also need appropriate PVC pieces (and PVC cement) to fashion a mounting bracket for the antenna. Find what you need at Home Depot or Lowe's. A piece of 1.5" i.d. Schedule 40 PVC pipe fits nicely on a 4' military aluminum mast section. Then use a couple of reducers and 1" i.d. pipe to mount your antenna.

Firmware is at the "Software-Download" drop-down at https://www.arednmesh.org (a recent URL change). Run the "U-Boot Test" program first to see if your device needs to be rolled back (mine did) to an earlier Ubiquiti® OEM firmware version *before* loading the AREDN® v3.16.1.1 firmware. Study the flashing instructions so you don't accidently brick your new transceiver (I'm not sure how easy, or hard, it is to brick). A naming convention for mesh nodes is "callsign-equipment-antenna-serial number" so my node is named "N8IK-BM2-OMNI-100". Other nodes then get an idea of what capability they can expect when routing through me. Move your channel to **-2** (2.397 GHz) and set the channel width to **10 MHz** so that you're not overlapping WiFi channel +1 and still staying in the Part 97 area of the 2.4 GHz band (which starts at 2.390 GHz). Create a browser bookmark called http://localnode.local.mesh:8080 to get to your node easily. Also upload the MeshChat 1.0 package available at http://www.trevorsbench.com/meshchat-messaging-for-mesh-networks/#installing.

73, Ian N8IK