

Ham 86 – Router, WiFi, Internet, and Cell.

Dr. Marc & Rosemary © 230331

1. Those that have been around a few months know that these articles are written to explain a question someone has asked. As a result, they are very practical and relevant, more so to some than others.
2. The co-author commented, “The internet is not working. I looked at all the lights on the router and am no sure what they mean.” So, we did a quick tutorial. This is the printed version, since others obviously have the same questions. You are a ham, so you will likely have the opportunity to play with the router / ethernet.
3. As you will see, many of the terms and devices have more than one definition or are interconnected.
4. *Internet* is the distributed interconnection of hardware devices external to the location. World Wide Web (www) is the software for accessing data from the internet.
5. *Modem* is a box which takes a signal from your phone / cable / satellite company.
 - a. This internet service provider (ISP) supplies one Internet Protocol (IP) address, your internet location.
 - b. The incoming line may be two-wire phone, coaxial, or fiber-optic cable.
 - c. The modem converts the signal to ethernet or phone.
 - d. Ethernet leaves on a 4-twisted pair cable with RJ-45 male connectors.
6. *Router* connects all your multiple devices together through wired ethernet or wireless Wi-Fi.
 - a. It gives each connected device its own internal IP address.
 - b. A router is your first line security with a firewall which determines which signals are allowed to pass.
 - c. Your Sling, Roku, Samsung, and Allstar node are assigned a port in the router to permit their specific signal to get through.
 - d. Wi-Fi is a radio signal broadcast rather than using ethernet-cable.
7. *Virtual Private Network (VPN)* is software to make the Internet perceive your router external address to be a different address and location. Your device logs into a remote server that becomes the reported address.
8. *Ethernet-switch* connects to an ethernet-line, then separates the signal into multiple lines.
9. *Wireless Access Point (WAP)* connects to your router and connects to ethernet-less devices via Wi-Fi.
10. *Extender* is located away from the router.
 - a. Extenders try to fix limitations of Wi-Fi range or number of ethernet connections.
 - b. These take myriad forms and shapes. The hardware includes a switch or wireless access point.
 - c. The simplest is a small box that connects to the ethernet, then provides multiple RJ45 outputs.
 - d. A Wi-Fi extender may connect to the wired ethernet or receive a signal from the router.
 - e. It re-broadcasts the Wi-Fi.
11. *Hotspot* is a physical location to obtain Internet access. It usually employs a WAP to connect to a router.
12. These are the lights on our router. Green is go. Wi-Fi and ethernet flash to indicate data transfer.
13. **Power** is the incoming electrical. If the router is not working, the first troubleshoot is to unplug about 15 seconds to allow all the stored energy to dissipate. Then re-plug.
14. **Broadband** is the signal from your internet service provider (ISP).
15. **Service** theoretically indicates the internal computer is working, but it flashes, goes steady with no apparent change.
16. **WiFi 2.4 GHz** is a wireless signal. 2.4 GHz is lower frequency so will it pass through walls better. Wi-Fi bounces off various surfaces, which is why devices often have multiple antennas.
17. **WiFi 5 GHz** carries more data and faster, but the signal deteriorates more with walls.
18. **Ethernet 1, 2, 3, 4** are wired sockets to which a cable with RJ45 male connector can join.
19. **Phone 1, 2** are land-line telephones. These are voice-over-internet-protocol (VOIP), just like Allstar.
20. **USB** is a serial connection used for programming.
21. A separate article tells how to get in the router to set ports for forwarding.
22. *Cellphone* is a wireless radio which connects to a cell tower.
 - a. Besides voice, it performs some of the same functions as a router system.
 - b. It connects to the Internet and may become a hotspot for other devices to connect.
23. Life is good. Enjoy!

