Enhanced Air-Card

2012 National HDT Rally

Air-Card Problems –

- Too Far Away
- Interference
- Need for local LAN

Problems – Too far away

The coverage of your carrier will have a great effect on your ability to receive an air-card signal.

Cell Amplifiers

- Cell amplifiers compensate for the low transmit power of the air-card.
- Cell amplifiers need an external antenna.
- There are two types of cell amplifiers.
  - Wireless
  - Wired
- Cell amplifiers are emerging that will handle 4G networks as well as 3G
  - The frequencies are different in namy cases

Cell Amplifiers - Wireless

- Wireless cell amplifiers can be used with cell phones as well as air-cards.
- Wireless cell amplifiers use an inside antenna as well as an external antenna.
- The wireless call amplifier is sending and receiving on the same frequencies inside as well as externally.
- Because the same frequencies are used, the inside antenna and the external antenna need a significant separation of they will step on each other.
- The inside antenna needs to be very limited to achieve the inside/external separation.

Cell Amplifiers - Wireless

Since the inside antenna and the external antenna are on the same frequency, they need to be separated.

With the external antenna in the back, the useful inside zone is near the front of the RV.

Cell Amplifiers - Wired

- Wired cell amplifiers can be used with one device, either a cell phones or an air-cards, at a time.
- Wired cell amplifiers use a cable to connect to the cell phone/air-card and an external antenna.
- Since sending and receiving is only done with the external antenna, there is no issue of antenna separation.
- Since the device is cabled to the cell amplifier, a fixed location for the air-card is preferred, as in an air-card router.

Cell Amplifiers - Wired

With a wired cell amplifier connected to your air-card and the air-card installed in an air-card router, the usefulness off the Internet is extended to the entire RV and a large area around it.

Problems – Interference

Roof mounted antenna will clear other RVs and have a direct shot at Cell Towers.

Antennas – Air-Card Types

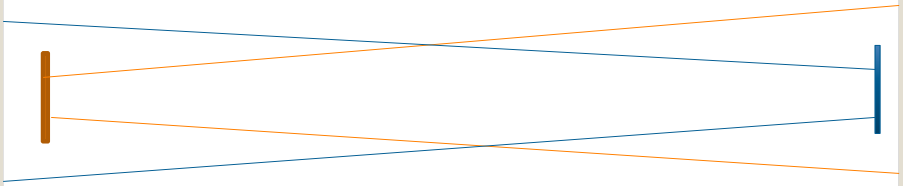
For air-cards and RVs, only an omni-directional antenna makes sense.

High Gain Yagi Antenna

Directional antenna
- Aiming a directional antenna to a cell tower is fitting for a fixed location like a cabin or house.

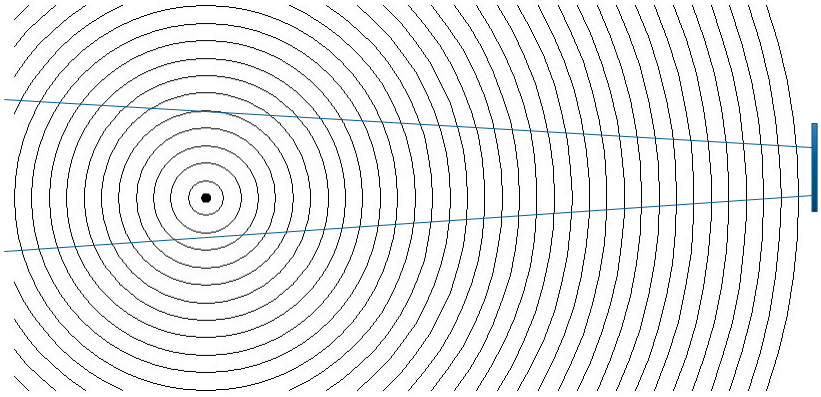
Omni-Directional
- All directions
- No aiming required
- Power not focused (DB)

Antennas – Yagi Directional



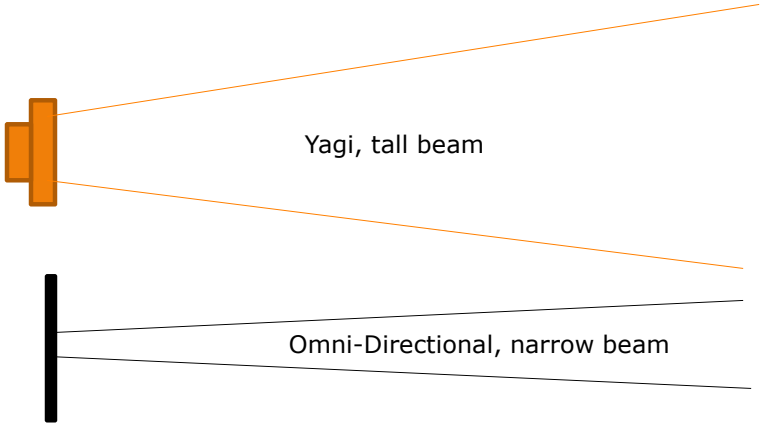
Horizontal beam in narrow pattern, power concentrated

Antennas – Omni-Directional



Horizontal beam in all directions, power spread out

Antennas – Vertical Beam



Generally, the higher the DB rating, the narrower the beam.

Problems – Too far away

Problems – Interference

- Both of these problems are fixed by using an external antenna.
- Location will minimize the Interference problem.
- Antenna power will minimize the Range problem

Antennas – Mounts – Air-Card

Some of the external cell antennas are short enough to be mounted permanently on the roof of your RV.

Longer ones need mounts that can be taken down for travel.

Antennas – Mounts

Another option is to use a device that you can raise from inside your RV, like if you have a "Batwing" or similar TV antenna.

This can be used for Wi-Fi and Air-Card antennas.

External Antennas – Issues

- To use just an antenna as an extension to you wireless PC connection, the connection (PC, PCMCIA card) needs a external antenna connector.
- Most antenna connections are pretty frail. Repeated connection of the antenna cable will take it's toll on the PC/modem connections.
- The cable used to connect your antenna will lose signal over long lengths. Larger cables have less lose but are harder to run.
- Remote antennas will mean large hole to pass the antenna ends through the side/roof of you rig.

External Antennas – Issues cont

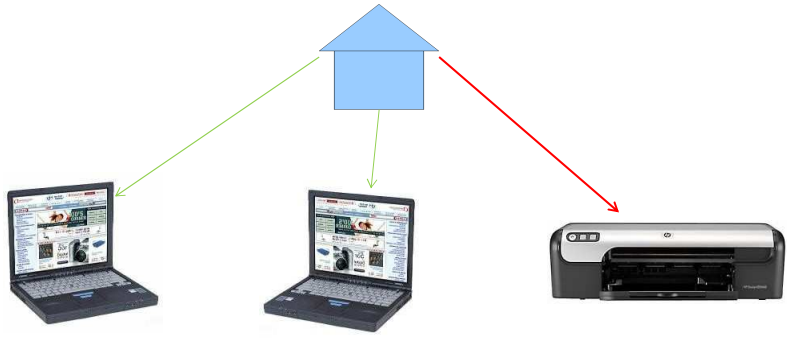
- External antennas have attached cables with larger (than CAT-5 cable) ends on them that will have to be routed into the RV
- There is a length limit on antenna cables that when exceeded you loose the benefit of the antenna. (Like 9'-15')
- In other words, connecting an external antenna to an air-card in a laptop is not a good solution.
- An external antenna is better connected to an air-card mounted in an air-card router.

Problems – Need for a local LAN



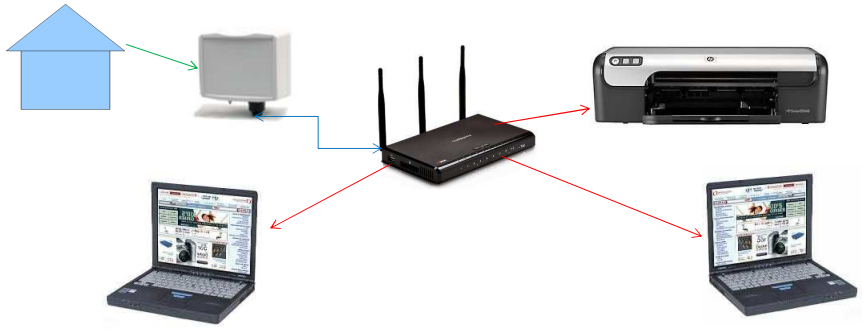

When you want multiple PC to access your wireless printer

Problems – Need for a local LAN



You can connect a PC to the Internet with an air-card but your other PCs and printer won't be able to communicate to each other nor the Internet

Problems – Need for a local LAN



By using an air-card capable router, your PCs and Printer can communicate on you local LAN and to the Internet via the air-card.

Basics – Router

The purpose of a Router is to connect two IP loops together.

The importance of a router to you is that is takes an IP address on the external side and changes it into one or more IP addresses on the local side.

Problems – Air-Card Router

An air-card router represents many positives to using an air-card for the Internet.

- Easy of cabling
- Multiple PC interfaces

The disadvantage of using an air-card router is that instant statistics on data usage is not available as these numbers are generated by a PC when the air-card is plugged in.

When using an air-card router, you have to rely on the web statistics which usually lag by a couple of hours.*

Recap

- External Antenna
- Wired Amplifier
- Router for local LAN

Evolution In Integration

Evolution in Integration

For people with Air-Cards, using a router capable of using the Air-Card makes sense. A CPE radio can be connected to the WAN (Wide Area Network) Port of the Air-Card router. The router can then be configured to use the Wi-Fi when available and the Air-Card when Wi-Fi isn't available.

Many Air-Card users have purchased CradlePoint routers for their Air-Card Capabilities.

Adding a CPE radio can be added.

The two devices are managed separately.

Evolution in Integration

The WIFIRanger is a new product that makes the use of an Air-Card and Wi-Fi even easier.

In its basic mode, the WIFIRanger is a Wi-Fi repeater. It connects to the park Wi-Fi and then connects to your PCs.

In this mode, the WIFIRanger does improve park Wi-Fi reception a bit, but the WIFIRanger alone, is subject to the same issues of Interference that your PC has inside the RV.

Adding the WIFIRanger Boost(actually a Bullet CPE) the reduction of Interference issues is accomplished (roof antenna) while management of the CPE is integrated into the router management.

Evolution in Integration

WIFIRanger has introduced software to provide a common UI (user interface) between multiple device (i.e. WFR, Boost)

- Easier to use
  - One UI instead of one for each device
- Can make trouble shooting harder

Discussion